# EFFECTIVENESS OF CUCUMBER JUICE UPON BLOOD PRESSURE LEVEL IN HYPERTENSIVE CLIENTS

**BY**

**KOCHURANI BENNY**

**A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF**

**MASTER OF SCIENCE IN NURSING**

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## DECLARATION

I hereby declare that the present dissertation entitled **"Effectiveness of cucumber juice upon blood pressure level in hypertensive clients"** is the outcome of the original research work undertaken and carried out by me under the guidance of **Dr. Latha Venkatesan,** M.Sc (N)., M.Phil (N)., Ph.D (N)., Principal, and Professor in Maternity Nursing, Apollo College of Nursing, **Mrs.Shobana G,** M.Sc (N)., Professor, Community Health Nursing Department, Apollo College of Nursing, Chennai. I also declare that the material of this has not been formed in any way, the basis for the award of any degree or diploma in this university or any other universities.

**M.Sc (N) - II Year**

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## SYNOPSIS

A Quasi Experimental Study to Assess the Effectiveness of Cucumber Juice Upon Blood Pressure Level in Hypertensive Clients at Selected Wards of Thiruverkadu Township, Chennai.

### Objectives of the study

1 To assess the level of blood pressure before and after administration of cucumber juice in control and experimental group of hypertensive clients.

2 To determine the effectiveness of cucumber juice by comparing the mean scores of blood pressure levels before and after administration of cucumber juice in control and experimental group of hypertensive clients.

3 To assess the level of satisfaction regarding cucumber juice administration upon blood pressure levels among experimental group of hypertensive clients.

4 To find out the association between selected demographic variables and blood pressure levels before and after administration of cucumber juice in control and experimental group of hypertensive clients.

5 To find out the association between selected clinical variables and blood pressure levels before and after administration of cucumber juice in control and experimental group of hypertensive clients.

The conceptual frame work was based on Ernestine Weidenbach's Helping Art of Clinical Nursing theory which was modified for the present study, and extensive review of literature and guidance by expert formed the foundation of development of the research tool.

A quasi experimental design was adopted for this study. Purposive sampling technique was used to select 30 in control group from Thiruverkadu Township and 30 in experimental group from Keelayanambakkam. The blood pressure assessment charter and rating scale for level of satisfaction on administration of cucumber juice were the tools used to collect data, after establishing validity and reliability. The main data collection was done after determining the feasibility and practicability through pilot study.

The hypertensive clients were identified by screening. The blood pressure level was checked for both control and experimental group before and after administration of cucumber juice. Cucumber juice was freshly prepared in a juicer. 125ml of this administered every day orally on empty stomach for four weeks and their level of satisfaction on cucumber juice was assessed. The data was tabulated and analyzed by using descriptive and inferential statistics.

## Major Findings of the Study

- Majority of hypertensive clients were in age group of 51to70 (76.6%,80%), were females (66.7%,70%), belonging to Hindu religion (70%,76.6%), married (100%,100%) and a significant percentage of hypertensive clients had no formal education (43.3%,43.4%),occupational status as home makers (36.6%,40%), with monthly income of 10001-15000 (40%,33.3%), in control and experimental group respectively.
- Majority of the hypertensive clients had been suffering from hypertension for a duration between 1 to 5 yrs (66.7%, 76.6%), had no family history of hypertension (63.3%, 46.6%), were on oral anti hypertensive agents (83.3%,

90%), had body weight between 51-60 kg (50%, 46.67%), with height 151 to 160 cm (43.3%, 67%), with BMI between 19 to 24 (80%, 83.33%), non vegetarians (46.6%, 56.67%), sedentary workers (66.75, 66.7%) absence of co morbidities (60%, 50%), not on other alternative or complementary therapy (100%, 100%), had no habit of smoking (80%, 73.3%) and had no habit of alcoholism (86.6%, 70%) in control and experimental group respectively.

- Majority of the hypertensive clients in the control and experimental group had mild deviations of systolic blood pressure (50%, 70%), and most of them had mild deviations of diastolic blood pressure (50%, 43.4%) before cucumber juice administration. But after cucumber juice administration there was a significant difference in the experimental group, 87% of clients had normal level of systolic blood pressure and 93.4% of clients had normal level of diastolic blood pressure. Where as in the control group 46.7% clients had mild level of systolic blood pressure and 80% of clients had mild level of diastolic blood pressure.
- In control group there was no significant difference in the mean and standard deviation of systolic blood pressure (M=157,152 & SD=13.58, 11.3) and diastolic blood pressure level (M=96, 90 & SD=7.06, 6.62) in pre test and post test assessment. Whereas experimental group showed a significant difference ($p<0.001$) in the mean and standard deviation of systolic blood pressure level (M=152, 123 & SD=13.3, 7.06) and diastolic blood pressure level (M=97, 77 & SD=7.26, 4.58) before and after administration of cucumber juice it can be attributed to the effectiveness of cucumber juice. Hence the null hypothesis $Ho_1$ was rejected.

- Majority of the hypertensive clients in the experimental group were highly satisfied with regard to researcher approach and nature of cucumber juice (83%), and most of the hypertensive clients were highly satisfied with regard to method of administration of cucumber juice (73%), and majority of the clients were highly satisfied with regard to the effectiveness of cucumber juice administration (100%) respectively.
- There was a significant association between the selected demographic variables of gender ($\chi^2$=8.2, df=1), education ($\chi^2$=6.4, df=1), income ($\chi^2$=8.43, df=1) and systolic blood pressure levels of hypertensive clients in pretest, and occupational status ($\chi^2$=5.56, df=1) in post test at ($p<0.05$) in the control group, but there was no significant association with other demographic variables. Hence the null hypothesis $Ho_2$ was rejected with regard to gender, education, income and occupational status. There was a significant association between demographical variable age ($\chi$2=4.80, df=1) and systolic blood pressure level in pretest and post test at ($p<0.05$) in the experimental group. So the null hypothesis $H0_2$ was rejected with regard to age. There was a significant association between demographical variable education ($\chi^2$=6.26, df=1) and diastolic blood pressure level in pre test at ($p<0.05$). So the null hypothesis $H0_2$ was rejected with regard to education.
- There was a significant association between the selected clinical variable weight ($\chi^2$=9.5, df=1) ($p<0.01$) and systolic blood pressure levels of hypertensive clients in pre test and post test in control group, but there was no significant association with other clinical variables. Hence the null hypothesis $Ho_3$ was rejected with regard to weight. There was a significant association between the selected

clinical variable BMI ($\chi^2$=5, df=1) ($p<0.05$) and diastolic blood pressure levels of hypertensive clients in pre test in control group, but there was no significant association with other clinical variables. Hence the null hypothesis $Ho_3$ was rejected with regard to BMI.

## Recommendations

The researcher recommends the following studies in the field of nursing research

- The same study could be conducted on larger samples for better generalization.
- The study could be replicated in different settings.
- A study could be conducted to assess the level of knowledge among nurses regarding the administration of cucumber juice for the management of the clients with hypertension.
- A similar study can be conducted with other traditional and herbal medicines.

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# CHAPTER I

# INTRODUCTION

## Background of the study

***"Life is not merely being alive, but being well"***

***Marcus Valorous Martial***

Non communicable diseases are top killers in South-East Asia Region, causing 7.9 million deaths annually. One third of these deaths is premature and occurs before the age of 60years, in the economically productive age groups. Demographic changes (ageing population), rapid unplanned urbanization, negative aspects of global trade and marketing, progressive increase in unhealthy lifestyle patterns, as well as social and economic determinants are accelerating the burden of non communicable diseases.

Four major non communicable diseases are cardiovascular diseases (including heart disease, hypertension, and stroke), diabetes, cancer and chronic respiratory diseases (including chronic obstructive pulmonary disease and asthma) are the leading cause of illness and death worldwide including the South-East Asia Region (SEAR). In addition to the health burden, non communicable diseases have serious social and economic consequences particularly for poor and disadvantaged populations.

In 2008, 63% (36 of 57 million) deaths worldwide occurred due to non communicable diseases. These deaths are distributed widely among people from high-income to low-income countries. About one-quarter of all non communicable diseases deaths were below the age of 60, amounting to approximately 9million deaths per year. Ninety percent of premature deaths from non communicable diseases occur in

developing countries. Nearly 80% deaths (29 million) occur in low- and middle income countries.

Among the non communicable diseases Hypertension is regarded as a major public health problem worldwide. The world health report identifies blood pressure as one of the five important risk factors for cardio vascular diseases globally. A recent report indicates that nearly one billion adults had hypertension in 2000 and this is predicted to increase to 1.56 billion by 2025. Average prevalence in India is 25% in urban and 10% in rural population. The data derived from two well planned studies in India, the prevalence of hypertension was 59.9 and 69.9 per 1000 males and females respectively in the urban population, and 35.5 and 35.9 per 1000 males and females respectively in the rural population.

The prevalence of hypertension among adults in developed countries is 25% and developing countries ranging from 10% to 20%. A population based study in 2011 conducted for Asian Indian women aged 35-70 yrs reveals that 39.2% women are hypertensive in which 39.5% lived in rural area and 58.2% in urban. In Tamilnadu, the prevalence rate of hypertension is 14.8% in the year 2011.

Changing lifestyle factors has documented efficiency in the primary prevention and control of hypertension. In addition to medical management complementary therapies also plays an important role in the reduction of hypertension which includes foot massage, yoga, reflexology, dietary management like garlic administration, coconut water administration, salt reduction etc. In home based set up dietary approach is

essential in management of hypertension. Vegetables have a greater effect on hypertension due to the presence of potassium, magnesium, vitamin C etc.

Among the different types of vegetables Cucumber (cucumis sativa) has over eighty nutrients which include vitamin A, B1, B2, B3, C and the minerals silica and molybdenum. It is also rich in potassium, manganese, folate, dietary fibre, magnesium, calcium and zinc. It is very low in calories with only 13 calories per 100 gram; therefore it is perfect as part of a calorie controlled diet. The flesh is primarily composed of water (90%) which act as diuretic by facilitating urination, helping to eliminate and neutralize toxins, helping to remove bacteria along the intestine and bladder.

Water and mineral content of potassium in cucumber will remove excess uric acid and metabolic wastes through the kidneys, and is effective in the control of high blood pressure. The research group called Dietary Approach to stop Hypertension (DASH), conducted scientific studies to ascertain the value of cucumber in the control of high blood pressure. In the studies the blood pressure of those who took part in research lowered their systolic reading by 5.5 point and their diastolic reading by 3.0 points.

## Need for the Study

According to Rule of halves Hypertension is an iceberg disease. It became evident that only about half of the hypertensive subjects in the general population of most developed countries were aware of the condition ,only about half of those aware of

the problem were being treated, and only about half of those treated were considered adequately treated.

Hypertension is the silent killer disease of today and the single most important predictor of cardiovascular risk. Community based studies reveal that the prevalence of hypertension went on increasing significantly with increase in socio economic status and increase in literacy status. The clients with hypertension are known to have a twofold higher risk of developing coronary artery disease, four times higher risk of congestive heart failure and seven times higher risk of cerebrovascular disease compared to normotensive subjects. WHO (2008) reports that hypertension causes 5 million deaths each year worldwide, causing 13% of global fatalities.

In addition to pharmacological management, dietary approaches play a major role in the control of hypertension. Most important is the intake of low cost diet rich in potassium and magnesium. Fruits and vegetable juices are good source of essential minerals like iron, copper, potassium, sodium, iodine, and magnesium. USDA guidelines for Americans state that ¾ cup of 100% vegetable juice is equivalent to one serving of vegetables. And studies reveal that juices provide same health benefits as whole vegetables in terms of reducing risk of cardio vascular diseases. Juice programmes often tout the value of adding chlorophyll, enzymes to the diet. It helps in the formation of haemoglobin, digestion, and absorption of food. Cucumber is rich in potassium and magnesium, and its water content is 90%, so it was great as a natural remedy for hypertension.

The community health nurse has major role in identifying the prevalence of hypertension, treating the affected, and educating the high risk population. Many researchers have studied the effectiveness of other nutritional therapies up on hypertension. But the researches on effectiveness of cucumber upon hypertension were found to be very less and these factors promoted the investigator to select the present problem for the study.

## Statement of the Problem

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## Operational Definitions

**Effectiveness**

In this study it refers to the outcome of cucumber juice administration with regard to reduction in blood pressure levels as determined by the difference in mean scores of blood pressure before and after administration of cucumber juice by using appropriate statistical method.

**Cucumber juice**

In this study it refers to juice extracted by the process of crushing skin peeled cucumbers in a juicer and extracting the juice with use of a strainer and 125 ml of this juice is administered every day before breakfast for a period of 30 days.

**Hypertensive clients**

In this study, hypertensive clients refers to those who are diagnosed to have hypertension by a physician, that is with the systolic blood pressure more than or equal to 140 mmHg and diastolic blood pressure more than or equal to 90mmHg and is taking anti hypertensive medication under prescription.

**Satisfaction**

It is a feeling of gratification attained or achieved by hypertensive clients with cucumber juice administration as measured by self rating scale.

## Assumptions

The study assumes that:

- Hypertension is a significant public health problem.
- Adults are at risk for hypertension.
- Hypertension leads to many complications.
- Blood pressure can be maintained normal by exercise, medication and complementary therapies.
- Dietary supplement plays a vital role in the reduction of blood pressure.
- Cucumber is a very good source of potassium, vitamin A, C, magnesium, folate, dietary fiber, silica and it has various therapeutic properties.

## Null hypotheses

**Ho1:** There will be no significant difference in the blood pressure levels before and after administration of cucumber juice in control and experimental group of hypertensive clients.

**Ho2:** There will be no significant association between selected demographic variables and blood pressure levels before and after administration of cucumber juice in control and experimental group of hypertensive clients.

**Ho3:** There will be no significant association between selected clinical variables and blood pressure levels before and after administration of cucumber juice in control and experimental group of hypertensive clients.

## Delimitations

- The clients who are under treatment for hypertension
- The study is limited up to 4 weeks

## Conceptual Framework of the Study

The conceptual framework for a particular study is the abstract, logical structure that enables the researcher to link the findings to nursing body of knowledge. Conceptual framework formalizes the thinking process, so that order may read and know the framework of reference, basic to research problem. The framework is built from a set of concept linked to a plan or existing system of methods, behaviours, functions and objectives.

It is developed from an existing theory of interest and proposing relationship among them. The model gives direction for planning research design, data collection and interpretation of findings. (Polit & Beck, 2004)

The present study aims to assess the effectiveness of cucumber juice up on blood pressure among hypertensive clients. The framework of the study is based on 'Weidenbach's Helping Art of Clinical nursing theory'.

Ernestine Weidenbach's Helping Art of Clinical Nursing theory (1964) describes a defined situation and a way to attain it.

This theory has three factors

- Central purpose
- Prescription
- Realities

**Central Purpose**

It refers to what the investigator wants to accomplish. It is the overall goal towards which the investigator strives. In this study, it refers to the management of blood pressure among hypertensive clients.

**Prescription**

It refers to the plan of care for the participants of study. It will specify the nature of action that will fulfill the investigator's central purpose. In this study it refers to the intervention planned by the investigator who will administer cucumber juice for reducing blood pressure in hypertensive clients who will fulfill the sampling criteria.

**Realities**

It refers to the physical, physiological, emotional and spiritual factors that come into play in a situation involving investigator action. The five realities identified by Weidenbach's are agent, recipient, goal, means, activities and framework

In this study it refers to the following

- Agent : Investigator
- Recipient : Hypertensive clients who are in the age group of 31 – 70 years.
- Goal : To check the effectiveness of cucumber juice up on blood pressure among hypertensive clients.
- Means : cucumber juice on selected samples of hypertensive clients.
- Framework : Selected wards of Thiruverkadu.

The conceptualization of nursing practice according to this theory consist of three steps

Step I – Identifying the need for help

Step II- Ministering the needed help

Step III – Validating that the need for help was met

**Step I: Identifying the need for help**

This step involves determining the need for help. The severity of blood pressure among hypertensive clients was assessed. Purposive sampling technique was used to select the participants for experimental study. The severity of blood pressure was assessed by using sphygmomanometer.

**Step II: Ministering the needed help**

After the assessment of blood pressure, cucumber juice was administered to the hypertensive clients.

**Step III: Validating that the need for help was met**

It is accomplished by means of assessing blood pressure after cucumber juice administration. It is followed by analysis of the findings.

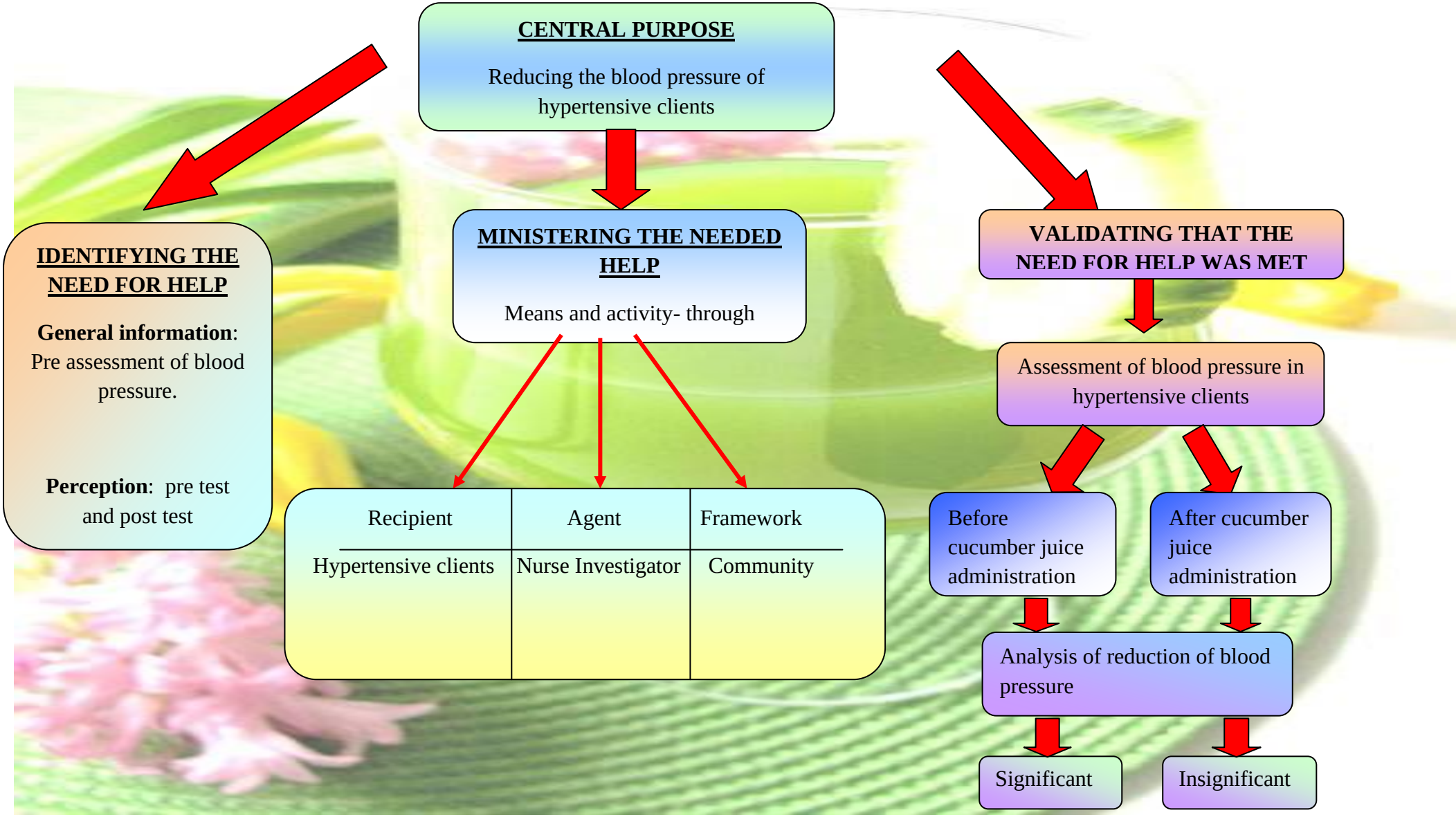


**Fig. 1 Conceptual Framework based on Wiedenbach's Helping Art of Clinical Nursing**

## Projected Outcome

The outcome of the study was reduction in the systolic and diastolic blood pressure level of hypertensive clients in the experimental group after cucumber juice administration.

## Summary

This chapter has dealt with the background, need for the study, and statement of the problem, objectives, operational definitions, assumptions, null hypotheses, delimitations and conceptual framework.

## Organization of the Report

Further aspects of the study are presented in the following five chapters

**Chapter – II:** Review of literature.

**Chapter – III**: Research methodology- which includes research approach, design, setting, population, sample and sampling techniques, tool description, content validity and reliability of tools, pilot study, data collection procedure and plan for data analysis.

**Chapter – IV:** Analysis and interpretation of data.

**Chapter – V:** Discussion.

**Chapter – VI:** Summary, conclusion, implications and recommendations.

# CHAPTER II

## REVIEW OF LITERATURE

A literature review involves the systematic identification, location, scrutiny and summary of written materials that contain information on the research problems. (Polit and Hungler, 2007)

"Conducting a literature review is a little bit like doing a full –fledged study". The review of literature has two major goals: (1) To provide readers with a overview of existing evidence on the problem being addressed and (2) To develop an argument that demonstrates the need for the new study. According to nursing research by Polit (2008),'review of literature is a written summary of the state of evidence on a research problem'.

This chapter deals with a review of published and unpublished research studies and there forms related material for the present study. The review helped the researcher to develop an insight in to the problem area. This helped the researcher in building foundation of the study.

The review of literature related to the present study is organized under the following headings

- Literature related to prevalence of hypertension
- Literature related to alternative therapies for hypertension
- Literature related to health benefits of cucumber
- Literature related to effectiveness of cucumber juice up on hypertension

**Literature related to prevalence of hypertension**

The first-ever comprehensive public evaluation of the prevalence of non communicable diseases in rural Tamil Nadu in 2011 has concluded that the prevalence of hypertension is 14.8 per cent and diabetes, 13.5 per cent in the under-30 population. The analysis is a result of over 46,000 camps (NCD) conducted in (42 health unit districts) the rural areas of the State, testing over 21 lakh people who attended them. This makes it one of the largest population studies ever done in this part of the country for Non Communicable Diseases in the public sector. In terms of sheer numbers this works out to 3, 23,254 people with hypertension, 13.5 per cent with Diabetes at 1, 83,914, and persons with both conditions are 8, 01,329. This puts just over 36.7 per cent of the rural population at risk of complications due to hypertension and diabetes, including organ failure, stroke and heart attack, More women than men had both hypertension (1,79,230) and diabetes (1,70,242), according to the survey reported by Remya Kannan ( Tamilnadu-Hindu News-July 23) Chennai.

For many patients, maximal medical therapy is insufficient to adequately treat refractory hypertension. New technology and interventions have been developed that allow for treatments that do not rely on medications. Woolf KJ et al (2011) reported that the nondrug interventions for treatment of hypertension. In addition, dietary supplements and modification, as well as herbal supplements, may be useful under the right circumstances. Lifestyle modification remains a necessary part of treatment for all patients with hypertension.

A prospective study conducted at Finland with a median follow-up of 20 years by Barengo (2009) including 22 836 men and 24 774 women aged 25-64 years to investigate whether there are differences in stroke risk among hypertensive men and women by awareness, treatment and blood pressure control status at baseline, Hypertensive and treated men and women had a statistically significantly higher risk of total stroke than normotensive people despite baseline blood pressure control. Whereas the hazard ratio for incident ischemic stroke was 1.85, for the hypertensive treated and controlled women and men with their hypertension treated and controlled did not have a statistically significant increased risk of ischemic stroke compared with the reference group. This stresses the importance of effective early management of hypertension.

A study to see the prevalence, awareness treatment, and control of hypertension in the rural areas of Davanagere was conducted in the year 2007 by Yuvaraj. The results shows that prevalence rate of hypertension in the study population were 3% (95% CI, 16.7-19.9%). Prevalence of hypertension was more in males 19.1% (95% CI, 16.7-21.5%) than in females 17.5% (95% CI, 14.9-20.1%); 11.6%, 5.6%, and 1.2% of the total subjects had Grade I, Grade II, and Grade III respectively. Only 33.8% of them were aware of their hypertensive status. Hypertensive of 33.1% was on treatment, and 12.5% adequately controlled their blood pressure.

In an urban community of India a prevalence study was conducted by Das in 2005, using the JNC VII criteria with the aim of identifying the risk factors and suggesting intervention strategies. A total of 1609 respondents out of 1662 individuals participated. Age and sex-specific prevalence of hypertension showed progressive rise of systolic and diastolic hypertension in women when compared to men. Men showed

progressive rise in systolic hypertension beyond fifth decade of life. Bivariate analysis showed significant relationship of hypertension with age, sedentary occupation, body mass index (BMI), diet, ischemic heart disease, and smoking. The observed prevalence of hypertension in this study and other studies suggest the need for a comprehensive national policy to control hypertension in India, and in other similar developing countries.

R Gupta (2005) performed nationwide population-based studies among women aged 35–70 years were performed in four urban and five rural locations. Stratified sampling was performed and we enrolled 4608 (rural 2604 and urban 2004) of the targeted 8000 (57%). Demographic details, medical history, diet, physical activity, anthropometry and blood pressure (BP) were recorded. Descriptive statistics are reported. Age-adjusted prevalence of hypertension (known or BP140/90 mm Hg) was observed in 1672 women (39.2%) (Rural 746, 31.5%; urban 926, 48.2%). Hypertension awareness was noted in 727 women (42.8%), more in urban (529, 56.8%) than in rural (198, 24.6%). Of these, 38.6% of the women were on treatment (urban 35.7, rural 46.5) and of those treated, controlled blood pressure (<140 and <90 mm Hg) was observed in 21.5% (urban 28.3 vs 10.2). Among hypertensive subjects, treatment was noted in 18.3% (rural 13.1, urban 22.5) and control in 3.9% (rural 1.3, urban 5.9). A significant determinant of low awareness, treatment and control was rural location (multivariate-adjusted $P<0.05$). There is a high prevalence of hypertension in middle-aged Asian Indian women. Very low awareness, treatment and control status are observed.

A community based study was carried out at the adopted village Chanai by HA Khadilkar (2005), a field practice area of Department of Preventive and Social

Medicine, S.R.T.R. Medical College, Ambajogai to find out the prevalence of hypertension in population 20 years and above and to study some socio-demographic factors affecting hypertension. A mass screening of 1419 subjects was done for blood pressure measurement. There were 84 cases of hypertension giving overall prevalence 5.92% (male-5.85% and female-6.00%). There was a significant increase in the prevalence of hypertension with increasing age in both sexes. The prevalence of hypertension went on increasing significantly with increase in socio-economic status and with increase in literacy status.

**Literature related to alternative management for hypertension**

Quota sampling technique was used to select 40 Hypertensive patients who were attending OPD at Kadathuruthy Co-operative hospital to assess the effectiveness of Garlic administration on blood pressure among hypertensive patients in Kadathuruthy Co-operative hospital, Kottayam in the year 2009 by Padmavathy. The results shows significant reduction in mean systolic blood pressure 151.3 mm Hg to 139.1 mm Hg and diastolic blood pressure 94.7 mm Hg to 86.6 mm Hg respectively.

Rayshalin (2005) conducted a study about the regular consumption of two tropical food drinks, coconut (Cocos nucifera) water and mauby (Colubrine arborescence), was tested on the control of hypertension. Twenty-eight hypertensive subjects were assigned to four equal groups and their systolic and diastolic blood pressures recorded for two weeks before and then for another two weeks while receiving one of four interventions. One group (the control) received bottled drinking water, the second group received coconut water, and the third received mauby and the fourth

group, a mixture of coconut water and mauby. Significant decreases in the mean systolic blood pressure were observed for 71%, 40% and 43% respectively of the groups receiving the coconut water, mauby and the mixture. For the group receiving the mixture, the largest decreases in mean systolic and mean diastolic pressure were approximately double the largest values seen with the single interventions.

The study conducted in Boston University School of Medicine by Duffy and Stephen J (2005) reported that daily supplementation with vitamin C (ascorbic acid) can significantly reduce blood pressure in people suffering from hypertension. Their randomized, placebo-controlled study involved 39 patients (average age of 49 years) 29 of whom were taking antihypertensive medication. The study participants had diastolic blood pressure between 90 and 110 mm Hg and did not suffer from diabetes, coronary artery disease or heart failure. After fasting overnight the patients had their blood pressures (systolic, mean, and diastolic) measured and had urine and blood samples collected. The measurements were repeated two hours after receiving a 2-gram oral dose of ascorbic acid or placebo and again after 30 days of oral supplementation with 500 mg/day of ascorbic acid or placebo. The researchers found that blood pressures were similar at baseline and after the acute treatment (2-gram dose). At the end of the 30-day period, however, the average systolic pressure in the vitamin C group had decreased from 155 mm Hg to 142 mm Hg and the mean pressure had decreased from 110 to 100 mm Hg. No changes were observed in the placebo group. The average diastolic pressure in the vitamin C group also decreased, but the difference from the placebo group was not statistically significant. The researchers conclude that oral supplementation with 500

mg/day of ascorbic acid is useful for blood pressure control in patients with high blood pressure.

In 2004 Researchers at the University of Naples have concluded a one-year trial to determine if an increased potassium intake decreases the need for anti-hypertensive medication. A group of 54 patients who were all controlling their high blood pressure with medication participated in the study. Half of the group maintained their regular diet while the diet of the other half was modified to increase the amount of potassium-rich food. The extent of the dietary modification was such that the sodium to potassium ratio was 1:1 rather than the customary 3.5:1. At the end of the trial period the group on the high potassium diet consumed less medication than the other group and 38% of them had discontinued medication altogether. The group on the potassium-rich diet also reported a significant (55%) reduction in symptoms related to their hypertension.

People with a high vitamin C concentration in their blood have lower blood pressures than do people with little vitamin C confirmed by Augusta et al (2003) researchers at the Medical College of Georgia. They tested 168 healthy people, 56 of which were taking supplements containing ascorbic acid. Among their findings: plasma ascorbic acid levels were 11% higher in supplement users than in non-users; both diastolic and systolic blood pressure were about 5 mm lower in people having a high plasma level of vitamin C than in people having a low level. Blood levels of selenium, vitamin A and vitamin E were not found to affect blood pressure, but both obesity and smoking had a significant adverse effect.

Supplementation with potassium in the treatment and prevention of hypertension (high blood pressure) was conducted by Baltimore et al (2001) researchers at the Johns Hopkins University School of Medicine. A group of seven medical researchers

reviewed 33 randomized, controlled supplementation trials involving over 2600 participants. They conclude that potassium supplementation is effective in lowering both systolic and diastolic blood pressure. The average observed decrease in hypertensive patients was 4.4 mm Hg and 2.5 mm Hg for systolic and diastolic pressure respectively. In people with normal blood pressure the observed decreases were 1.8 mm and 1.0 mm. The researchers conclude that potassium supplementation should be considered as part of recommendations for prevention and treatment of hypertension.

**Literature related to Health benefits of cucumber**

A study published in the Journal of Cosmetic Dermatology by Woolery Lloyd in 2010 explored the effects of topical vitamin C as a treatment for acne vulgaris. The double-blind study included 50 participants who used a topical vitamin C treatment for 12 weeks. The study concluded that the treatment demonstrated a significant improvement. The researchers theorized that vitamin C may act to prevent the oxidation of sebum, which produces and aggravates acne.

Researchers at Jadavpur University in India report that juice from the cucumber contains high levels of ascorbic acid, or vitamin C, which stops the action of elastase, a protein which breaks down elastin fibers in the skin. The results of their study, published in the Dec. 14, 2010 issue of "Archives of Dermatological Research," state that cucumber juice should be considered as an anti-wrinkle agent for the cosmetic industry. The application of a paste of cucumber on skin affected by acne will reduce the severity and occurrence of pimples.

A research paper published in the "African Journal of Pharmacy and Pharmacology" in 2010 tested the efficacy of six formulas for acne creams. The

researchers found that the inclusion of cucumber extract increased the anti-acne action of the treatment while reducing the side effects.

Phyllis logie in British Nutrition Foundation explained that Cucumber's scientific name is Cucumis Sativas and comes in no less than fifty different varieties belonging to the gourd family. It has over eighty nutrients which include Vitamins A, B1, B2, B3, B6 and C plus the minerals silica and molybdenum. It is also rich in potassium, manganese, folate, dietary fibre, magnesium, calcium and zinc. It is very low in calories with only 13 calories per gram; therefore it is perfect as part of a calorie controlled diet. The flesh is primarily composed of water, 90% to be precise and apart from being naturally hydrating and containing ascorbic acid and caffeic acid both of which are recognised as having the ability to sooth sensitive and irritated skin. It is able to reduce swelling, puffy eyes and sooth burns and dermatitis. Cucumber skin is rich in silica which is essential for healing connective tissue such as muscles, tendons, bone, cartilage and ligaments. Because of its high potassium content, cucumber is effective in the control of high blood pressure.

**Literature related to effectiveness of cucumber juice up on hypertension**

Radhadevi (2010) conducted a study to assess the effectiveness of cucumber juice on hypertensive subjects in Calicut district of Kerala. The sample size 30 was in the experimental group and 30 in the control group. One glass of cucumber juice (125 ml) was provided to the experimental group every day before breakfast for a period of 2 months. The results shows that a considerable reduction of systolic pressure by 6mmHg in males and 5mmHg in females, and reduction of diastolic pressure by 2.7mmHg in males and 3.85 mmHg in females after 1 month of supplementation. It also showed that

supplementation of cucumber juice to mildly hypertensive subjects brought about significant improvement in blood pressure, lipid profile, serum electrolytes, serum magnesium, vitamin A and vitamin E levels. Hence, the use of cucumber juice as food supplement for management of hypertension may be suggested.

In 2004 Dalian conducted clinical and experimental study of tablet cucumber vine compound in treating essential hypertension. 389 patients with essential hypertension were divided into two groups randomly. 241 patients were treated by tablet of cucumber vine compound and 148 patients by tablet of hypotension compound as control. The symptomatic marked improvement and total effective rate were 63.1% and 81.7% in the treated group and 39.2% and 67.0% (P less than 0.01) in the control group respectively. The marked effective rate in decrease of blood pressure and total effective rate were 52.7%, 90.9% and 58.1%, 92.6% (P greater than 0.05) respectively.

A study to determine the effectiveness of cucumber to reduce hypertension conducted by Camello (2004) .In the study population are people who suffer from hypertension, approximately 20 people, and samples of some people who suffer from hypertension in the village Brenggolo. The design of this study is the experimental design with pre-pre-post test design one group with no comparison group. The calculation is done pre test and post and then taken the average value and standard defiasinya. From this study, reduction in hypertension with a significant level of 0.000 with one degree of hypertension patients a total of 100% or 20 respondents pendrita hypertension. Including pre-hypertension are as many as 12 respondents (60%), and a small percentage of respondents who included hypertension first level there are three respondents (15%) and there are respondents who included five normal respondents (25%).

The research group called Dietary Approach to Stop Hypertension (DASH), (2001) conducted scientific studies to ascertain the value of cucumber in the control of high blood pressure. In the studies the blood pressure of those who took part in the research lowered their systolic reading by 5.5.point and their diastolic reading by 3.0 points.

Dr. Armughan Riaz, EECP Consultant Cardiologist (2010) says that cucumbers can be amazingly useful in controlling high blood pressure. In fact, drinking its juice can help you in lowering blood pressure without using medications. Cucumbers, though they look ordinary enough, are abundant in many beneficial nutrients. These are a good source of acquiring vitamins A and C which is a powerful antioxidant and helps in lowering blood pressure, folate, caffeic acid and silica. If this is not enough to sell you on the benefits of cucumber, then here is more. It is also rich in potassium, magnesium and fibre, three constituents that are very important in the management of high blood pressure. A recent study has shown that eating foods high in these three nutrients is an effective way of dealing with high blood pressure.

## Summary

This chapter dealt with the review of literature related to the problem stated. In this study the investigator collects review from 13 primary resources and 9 secondary sources. It also enabled the researcher to design the study to develop the tool, plan for data collection procedures and analysis of data.

# CHAPTER III

# RESEARCH METHODOLOGY

It indicates the general pattern of organizing the procedure of gathering valid and reliable data for investigation. The methodology of the research study is defined as the way, the data was gathered and analyzed in order to answer the research questions or analyze the research problem. The research methodology involves a systematic procedure by which the researcher starts from initial identification of the problem to its conclusion.

This chapter deals with a brief description of different steps undertaken by investigator for the study. It includes research approach, research design, the setting, population, the sample and sampling technique, development and description of tool, content validity, reliability, pilot study, protection of human rights and procedure for data collection and plan for data analysis.

## Research approach

Research approach is the most significant part of any research. The appropriate choice of the research approach depends on the purpose of the research study which is undertaken. According to Polit & Beck (2004), Experimental research is an extremely applied form of research involving in finding out how well a programme, practice or policy is working. Its goal is to assess or evaluate the success of programme.

To accomplish the objective of this study, an experimental approach was considered most appropriate as the researcher wanted to assess the effectiveness of

cucumber juice up on blood pressure level. In this study experimental research approach was used.

## Research design

A research design incorporates the most important methodological design that researcher work in conducting a research study (Polit and Beck 2004).

A quasi experimental research design was used in the study

O1 - O2

O1 X O2

O1-Assessment of blood pressure level before administration

O2- Assessment of blood pressure level after administration

X- Cucumber juice administration

## Variables

Variable is an attribute that varies, that is takes on different values (Polit, 2010).

### Dependent variable

In this study dependent variable was blood pressure level in hypertensive clients

### Independent variable

In this study the independent variable was administration of cucumber juice

### Attribute variable

A variable that confounds the relationship between the independent and dependent variables that needs to be controlled either in the research design or through statistical procedures (Polit & Beck 2008).

In this study it includes the demographic and the clinical variables which had influence on blood pressure level of hypertensive clients.

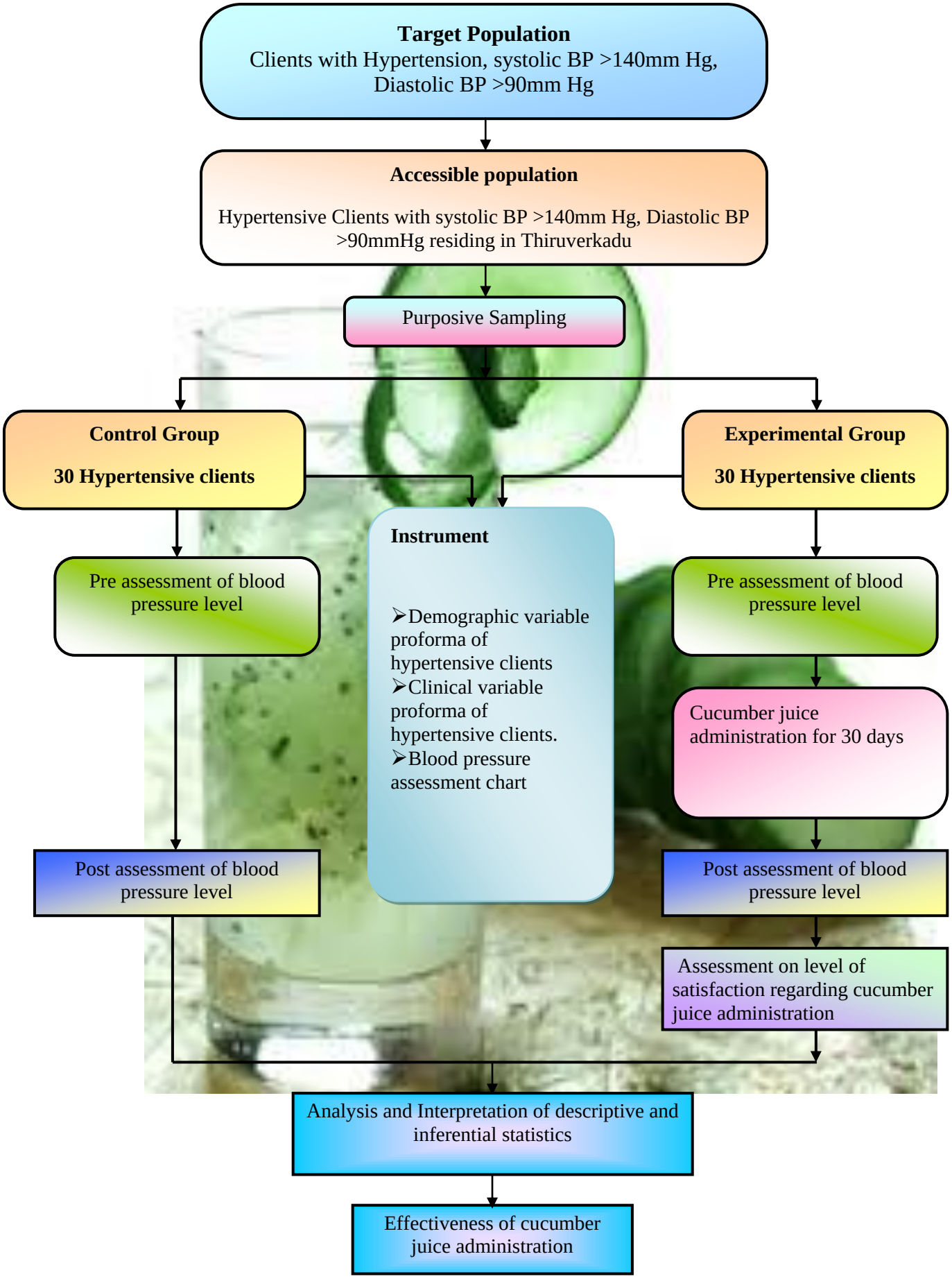


**Fig.2 Schematic Representation of Research Design**

## Research Settings

Experimental group – Ponniamman nagar, Ayanambakkam

Control group – Kamadenu nagar, Thiruverkadu.

## Population

According to Polit and Beck (2008) setting is the physical location and condition in which data collection takes place in a study.

## Target population

Target population is the group of population, that the researcher is aimed to study and to whom the study findings will be generalized. In this study target population was all patients with hypertension.

## Accessible population

Accessible population is the list of population, the researcher finds in the research area. Accessible population in this study was the patients with hypertension residing in selected wards of Thiruverkadu.

## Sample

Patients with hypertension who fulfill the inclusion criteria and residing in wards of Thiruverkadu.Total sample size is 60, out of which 30 samples each in experimental and control group.

## Sampling technique

It was stated by Polit and Beck (2010) that sampling referred to the process of selecting a portion of the population to represent the entire population. A Purposive sampling technique was used for the present study.

**Inclusion criteria**

Hypertensive clients:

- Who are willing to participate
- Between the age group of 30-70yrs
- Who knows Tamil and English
- Who are under treatment

**Exclusion criteria**

- Hypertensive clients with complications
- Hypertensive clients having allergic history with cucumber
- Hypertensive clients who are not willing to consume cucumber
- Hypertensive clients who are on other herbal medicines, complementary therapy or potassium supplements

## Selection and Development of Study Instruments

As the study aimed to evaluate the effectiveness of cucumber juice upon blood pressure level, the data collection instruments were developed through an extensive review of literature in consultation with the opinion of experts and with the opinion of faculty members. The instruments used in this study were demographic variables

proforma, clinical variable proforma, and blood pressure assessment chart, and rating scale on level of satisfaction regarding cucumber juice administration.

**Demographic variable Proforma of hypertensive clients**

Demographic variable proforma includes age, gender, education status, occupation status, religion, marital status, and family income. The researcher collected the data by interviewing the patient.

**Clinical variable Proforma of hypertensive clients**

Clinical variable proforma Comprises of duration of known period of hypertension, family history of hypertension, weight, height, BMI, diet pattern, medications used, presence of other co morbidities, habit of smoking, and habit of alcoholism. The researcher collected the data by interviewing the patient.

**Blood pressure assessment chart**

This was used to assess the systolic and diastolic blood pressure levels before and after cucumber juice administration, tested by sphygmomanometer.

The blood pressure values were classified based on the British Hypertension Society as follows

| **Range** | **Systolic blood pressure** | **Diastolic blood pressure** |
|---|---|---|
| Mild | 140-159 mm of Hg | 90-99 mm of Hg |
| Moderate | 160-179 mm of Hg | 100-109 mm of Hg |
| Severe | >180 mm of Hg | >_110 mm of Hg |

**Rating scale on level of satisfaction regarding cucumber juice administration**

This rating scale consists of 10 statements on satisfaction of clients regarding cucumber juice administration upon blood pressure level. The response extended from highly satisfied, satisfied, dissatisfied, highly dissatisfied.

| **Scoring** | **Interpretation** |
|---|---|
| >76 | Highly satisfied |
| 51-75% | Satisfied |
| 26-50% | Dissatisfied |
| < 25% | Highly dissatisfied |

## Psychometric Properties of the Instruments

### Validity

The content validity refers to the degree to which the item on an instrument adequately represents the universe of the content (Polit and Beck 2010). The content validity of the tool was obtained by getting opinion from seven experts. The validation has suggested some specific modifications. The modifications and suggestions of experts were incorporated in the final preparation of the tool.

### Reliability

Reliability refers to the accuracy and consistency of measuring tool (Polit and Beck, 2010).

1. **Blood pressure assessment chart**

   The reliability of the instrument (sphygmomanometer) was determined by inter rater reliability technique and the 'r' value was found to be 0.8 which shows positive correlation indicates that instrument is highly reliable.

2. **Rating scale on level of satisfaction regarding cucumber juice administration**

   The satisfaction scale was tested using split half method and the reliability was found to be 0.98, indicating that the tool is highly reliable.

## Pilot Study

Polit and Beck (2010) states that pilot study is a miniature of some parts of the actual study in which the instruments are administered to the subjects drawn from the same population. It is a small scale version or trial run done in preparation for the major study. The purpose is to find out the feasibility and practicability of the study design.

The pilot study was conducted on 6 Samples selected from Rajankuppam village as experimental group and 6 samples were selected from keelayanambakkam as control group. Rapport was established with clients. The subjects were chosen by purposive sampling, 6 in control group and 6 in experimental group. Systolic and diastolic blood pressure level was assessed for both the control and experimental group. Cucumber juice was administered for the experimental group once a day before breakfast for 7 days. At the end of the $7^{th}$ day systolic and diastolic blood pressure were assessed for both control and experimental group. Level of satisfaction was assessed through rating scale only in experimental group. The pilot study revealed that the present study was feasible to conduct.

## Protection of Human Rights

Permission was obtained from the Ethical Committee, Apollo Hospitals, Chennai and from chairman, Thiruverkadu Township to conduct the study in Ayanambakkam village. Written consent was obtained from the study participants and confidentiality was maintained throughout the study.

## Data Collection Procedure

The data collection is the gathering of information needed to address a research problem. The data collection was done for a period of one month from 1st July to 31st July 2011. The researcher introduced herself and obtained written consent from the subjects to participate in the study. An assurance was given regarding confidentiality while the actual data was collected. Researcher collected the data from hypertensive clients in the selected villages.

The present study was conducted in the 14th ward of Thiruverkadu and keel ayanambakkam village, Chennai. The hypertensive clients were identified by screening. Sixty clients were selected as the study participants by purposive sampling technique, 30 clients as control group from 14th ward of Thiruverkadu and 30 clients for experimental group from keelayanambakkam village. The study was primarily concerned to assess the effectiveness of cucumber juice upon blood pressure level of hypertensive clients in the selected villages.

The baseline data of demographic variable, and clinical variable were collected before the intervention in both control and experimental group. The level of systolic and

diastolic blood pressure level were assessed on the 0 day, $7^{th\ day}$ , $14^{th}$ day, $21^{st}$ day and $30^{th}$ day of the intervention for both control and experimental group. The cucumber juice was prepared in a juicer using fresh cucumbers and was administered to the experimental group once a day before breakfast for 30 days. The hypertensive clients in the control group were not receiving any intervention. The level of satisfaction on cucumber juice administration was assessed in the experimental group by using rating scale.

## Problems Faced During Data Collection

The problems faced during the process of this study were,

- Some hypertensive clients not willing to participate
- Some clients expressed that the duration is long

## Plan for Data Analysis

Data analysis is the systematic organization and synthesis of research data and testing of null hypothesis by using the obtained data (Polit and Beck, 2010). Analysis and interpretation of data were carried out with descriptive statistics such as frequency, percentage, mean and standard deviation and inferential statistics such as independent‘t’ test and chi-square test.

## Summary

This chapter had dealt with the selection of research approach, research design, setting, population, sample, sampling technique, sampling criteria, selection and development of study instruments, validity and reliability of study instruments, pilot study, data collection procedure and plan for data analysis. The following chapter deals with analysis and interpretation of data using descriptive and inferential statistics.

# CHAPTER -1V

# ANALYSIS AND INTERPRETATION

Data analysis is conducted to reduce, organize and give meaning to the data. The results obtained from data analysis require interpretation to be meaningful. Interpretation of data involves examining the results from data analysis forming conclusions, considering the implications for nursing, exploring the significance of the findings and suggesting further studies. (Burns and Groove, 2007)

This chapter deals with analysis and interpretation of data including both descriptive and inferential statistics. Stastistics refers to the analysis and interpretation of data with a view toward objective evaluation of the reliability of the conclusions based on the data.

The data were analysed according to the objectives and hypotheses of the study. Analysis of the data was compiled after all the data were transferred to the master coding sheet. The data were analysed, tabulated and interpreted using appropriate descriptive and inferential statistics.

## Organization of findings

- Frequency and percentage distribution of demographic variables in the control and experimental group of hypertensive clients
- Frequency and percentage distribution of clinical variables in the control and experimental group of hypertensive clients.

- Frequency and percentage distribution of level of blood pressure before and after administration of cucumber juice in the control and experimental group of hypertensive clients.
- Comparison of mean and standard deviation of systolic blood pressure before and after administration of cucumber juice in the control and experimental group of hypertensive clients.
- Comparison of mean and standard deviation of diastolic blood pressure before and after administration of cucumber juice in the control and experimental group of hypertensive clients.
- Frequency and percentage distribution of level of satisfaction on administration of cucumber juice among experimental group of hypertensive clients.
- Association between selected demographic variables and level of systolic blood pressure in pre test and post test in the control group of hypertensive clients.
- Association between selected demographic variables and level of diastolic blood pressure in pre test and post test in the control group of hypertensive clients.
- Association between selected demographic variables and level of systolic blood pressure before and after administration of cucumber juice in the experimental group of hypertensive clients.
- Association between selected demographic variables and level of diastolic blood pressure before and after administration of cucumber juice in the experimental group of hypertensive clients.
- Association between selected clinical variables and level of systolic blood pressure in pre test and post test in the control group of hypertensive clients.

- Association between selected clinical variables and level of diastolic blood pressure in pre test and post test in the control group of hypertensive clients.
- Association between selected clinical variables and level of systolic blood pressure before and after administration of cucumber juice in the experimental group of hypertensive clients.
- Association between selected clinical variables and level of diastolic blood pressure before and after administration of cucumber juice in the experimental group of hypertensive clients.

**Table. 1**

**Frequency and Percentage Distribution of Demographic Variables in Control and Experimental Group of Hypertensive Clients.**

| Demographic variables | Control Group (n=30) | | Experimental Group (n=30) | |
|---|---|---|---|---|
| | n | p | n | p |
| **Age in years** | | | | |
| 31-40 | 2 | 6.6 | 1 | 3.33 |
| 41-50 | 5 | 16.66 | 5 | 16.66 |
| 51-60 | 10 | 33.33 | 9 | 30 |
| 61-70 | 13 | 43.3 | 15 | 50 |
| **Religion** | | | | |
| Hindu | 21 | 70 | 23 | 76.6 |
| Christian | 9 | 30 | 7 | 23.3 |
| Muslim | - | - | - | - |
| Others | - | - | - | - |
| **Marital Status** | | | | |
| Married | 30 | 100 | 30 | 100 |
| Unmarried | - | - | - | - |
| Divorced | - | -- | - | - |
| Widow | - | - | - | - |
| Widower | - | - | - | - |

| | | | | |
|---|---|---|---|---|
| **Income per month** | | | | |
| < 10000 | 7 | 23.3 | 10 | 33.3 |
| 10001 to 15000 | 12 | 40 | 10 | 33.3 |
| 15001 to 20,000 | 7 | 23.3 | 7 | 23.3 |
| >20,000 | 4 | 13.33 | 3 | 10 |
| **Occupational Status** | | | | |
| Home maker | 11 | 36.6 | 12 | 40 |
| Labourer | 6 | 20 | 6 | 0 |
| Self employed | 4 | 13.33 | 5 | 16.66 |
| Government employee | 3 | 10 | - | - |
| Private employee | 2 | 6.6 | 5 | 16.66 |
| Retired | 4 | 13.33 | 2 | 6.6 |

It is inferred from the table 1 that majority of hypertensive clients were in age group of 51to70 (76.6%,80%), were females (66.7%,70%), belonging to Hindu religion (70%,76.6%), married (100%,100%) and a significant percentage of hypertensive clients had no formal education (43.3%,43.4%),occupational status as home makers (36.6%,40%), with monthly income of 10001-15000 (40%,33.3%), in control and experimental group respectively.

Fig. 3 shows that most of the hypertensive clients were females (66.7%, 70%) in control and experimental group respectively.

Fig. 4 reveals that most of the hypertensive clients had no formal education (43.3%, 43.4%) in control and experimental group respectively.

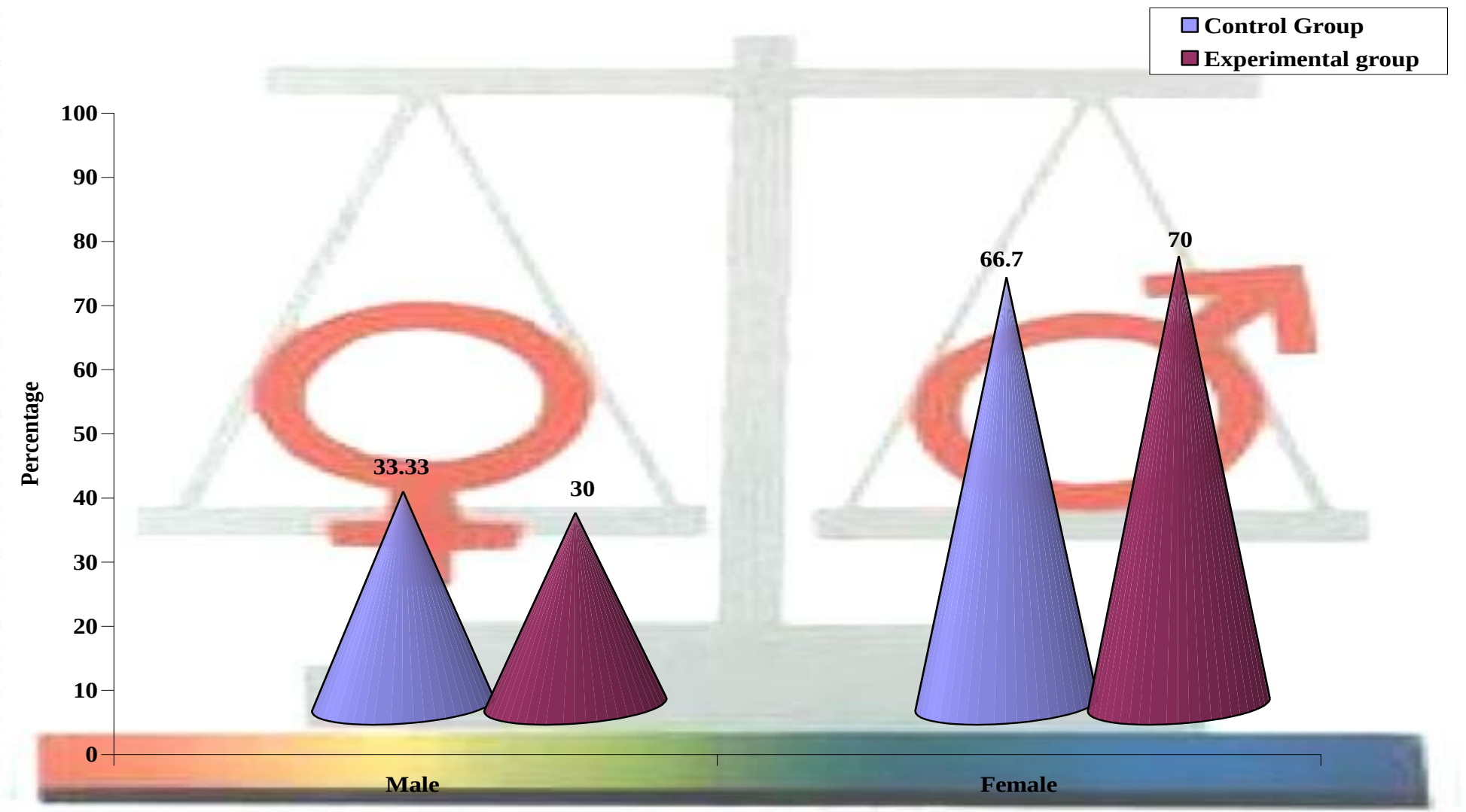


**Fig.3 Percentage distribution of gender of the hypertensive clients**

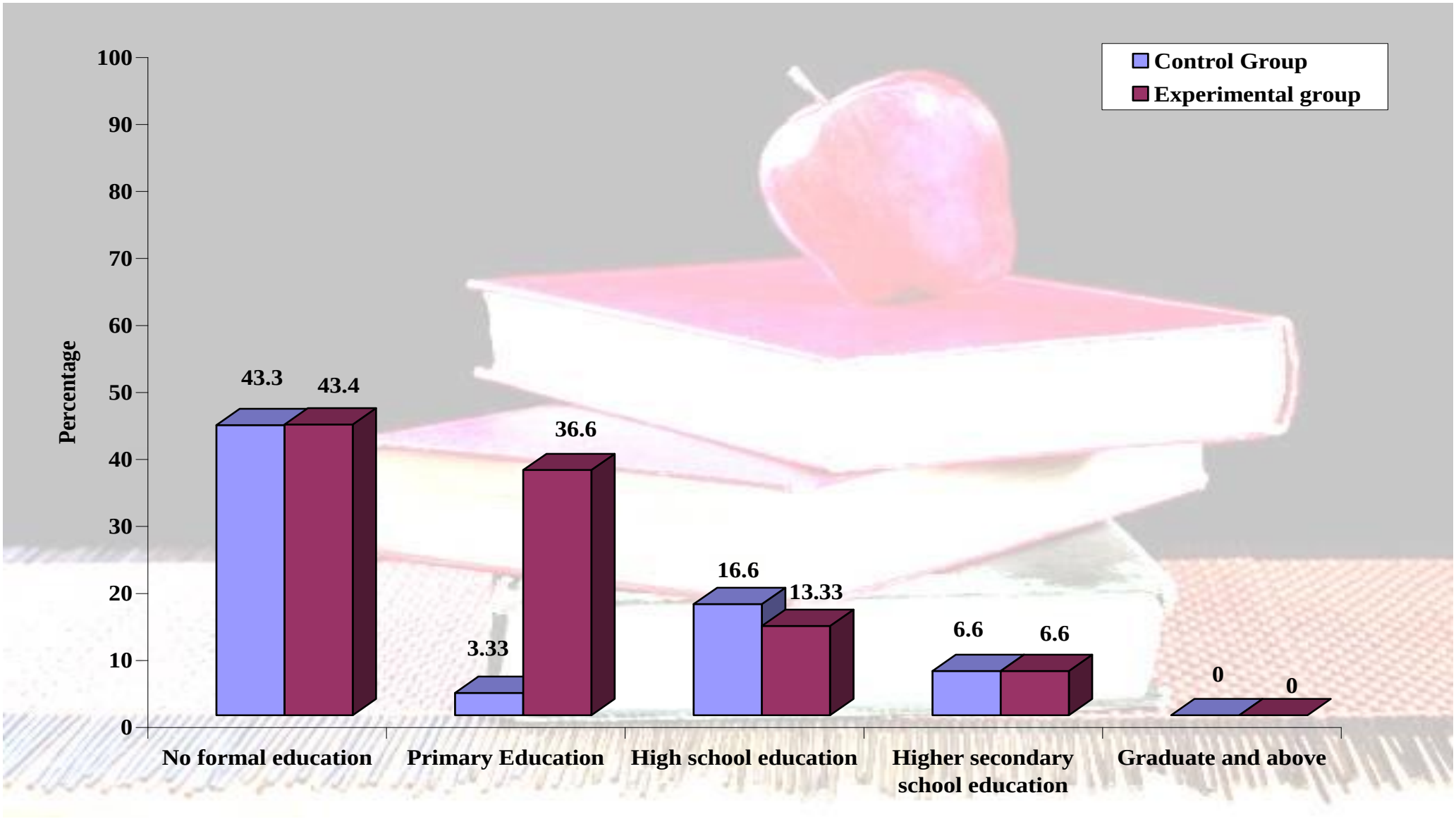


**Fig. 4 Percentage distribution of educational status of the hypertensive clients**

**Table. 2**

**Frequency and Percentage Distribution of Clinical Variables in Control and Experimental Group of Hypertensive Clients.**

| Clinical variables | Control Group (n=30) | | Experimental Group (n=30) | |
|---|---|---|---|---|
| | n | p | n | p |
| **Height** | | | | |
| ≤150 | 10 | 33.33 | 9 | 30 |
| 151-160 | 13 | 43.3 | 11 | 67 |
| 161-170 | 4 | 13.33 | 6 | 20 |
| 171-180 | 3 | 10 | 3 | 10 |
| >180 | - | - | 1 | 3.33 |
| **BMI** | | | | |
| <18.4 | - | - | 1 | 3.33 |
| 18.5-22.9 | 24 | 80 | 25 | 83.33 |
| 23-29.9 | 6 | 20 | 4 | 13.33 |
| >30 | - | - | - | - |
| **Non vegetarian diet** | | | | |
| Yes | 30 | 100 | 30 | 100 |
| No | - | - | - | - |
| **If yes, how many times do you take non vegetarian diet** | | | | |
| Daily | 1 | 3.33 | - | - |
| Once in a week | 14 | 46.6 | 9 | 30 |
| Twice in a week | 9 | 30 | 17 | 56.67 |
| Thrice in a week | 3 | 10 | 3 | 10 |
| Monthly once | 3 | 10 | 1 | 3.33 |
| **Nature of physical activity** | | | | |
| Sedentary | 15 | 50 | 14 | 46.6 |
| Moderate | 9 | 30 | 10 | 33.4 |
| Heavy | 6 | 20 | 6 | 20 |

| | | | | |
|---|---|---|---|---|
| **History of hypertension** | | | | |
| <1yr | 10 | 33.3 | 7 | 23.3 |
| 1-3yrs | 15 | 50 | 18 | 60 |
| 3-5yrs | 5 | 16.66 | 5 | 16.66 |
| >5yrs | - | - | - | - |
| **Family history of hypertension** | | | | |
| No | 19 | 63.3 | 14 | 46.6 |
| Parents | 8 | 26.6 | 11 | 36.6 |
| Grand parents | 3 | 10 | 5 | 16.6 |
| **Drugs** | | | | |
| Not taking antihypertensives | - | - | - | - |
| Taking regularly | 25 | 83.3 | 27 | 90 |
| Taking occasionally | 2 | 6.6 | - | 3.33 |
| Only during discomfort | 3 | 10 | 2 | 6.6 |
| **Co-morbidities** | | | | |
| No | 18 | 60 | 15 | 50 |
| Diabetes | 12 | 40 | 14 | 46.67 |
| Kidney disease | - | - | - | - |
| Heart disease | - | - | 1 | 3.33 |
| Any other diseases | - | - | - | - |
| **Whether on any other alternative / complementary therapy** | | | | |
| Yes | - | - | - | - |
| No | 30 | 100 | 30 | 100 |

From table 2 it is inferred that majority of the hypertensive clients had been suffering from hypertension for a duration between 1 to 5 yrs (66.7%, 76.6%), had no family history of hypertension (63.3%, 46.6%), were on oral anti hypertensive agents (83.3%, 90%), had body weight between 51-60 kg (50%, 46.67%), with height 151 to 160 cm (43.3%, 67%), with BMI between 19 to 24 (80%, 83.33%), non vegetarians

(46.6%, 56.67%), sedentary workers (66.75, 66.7%) absence of co morbidities (60%, 50%), not on other alternative or complementary therapy (100%, 100%), had no habit of smoking (80%, 73.3%) and had no habit of alcoholism (86.6%, 70%) in control and experimental group respectively.

Fig. 5 infers that most of the hypertensive clients had body weight between 51-60 kg (50%, 46.7%) in control and experimental group respectively.

Fig. 6 reveals that majority of the hypertensive clients had no habit of smoking (80%, 73.3%) in control and experimental group respectively.

Fig. 7 reveals that majority of the hypertensive clients had no habit of alcoholism (86.6%, 70%) in control and experimental group respectively.

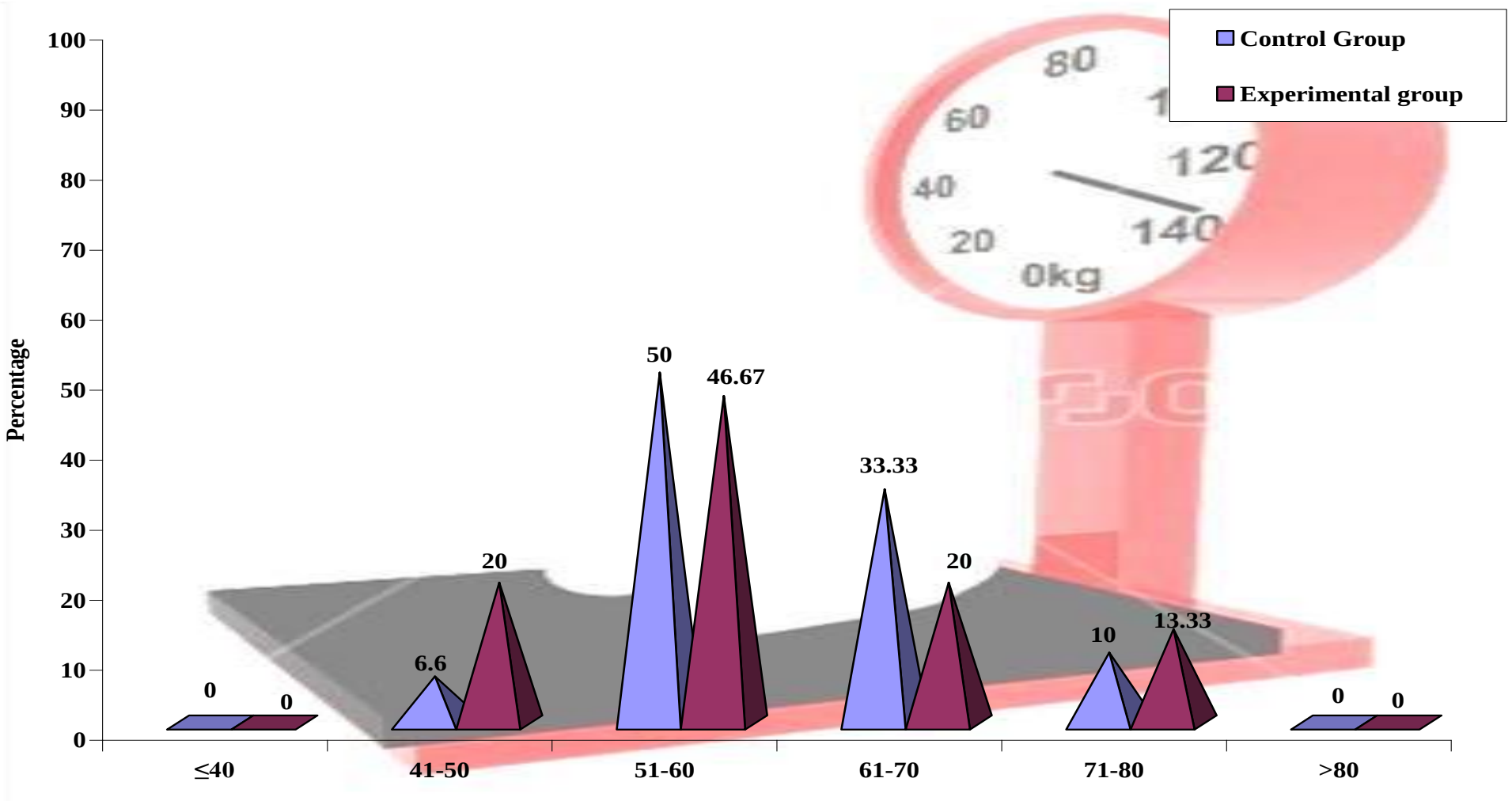


**Fig. 5 Percentage distribution of weight of the hypertensive clients**

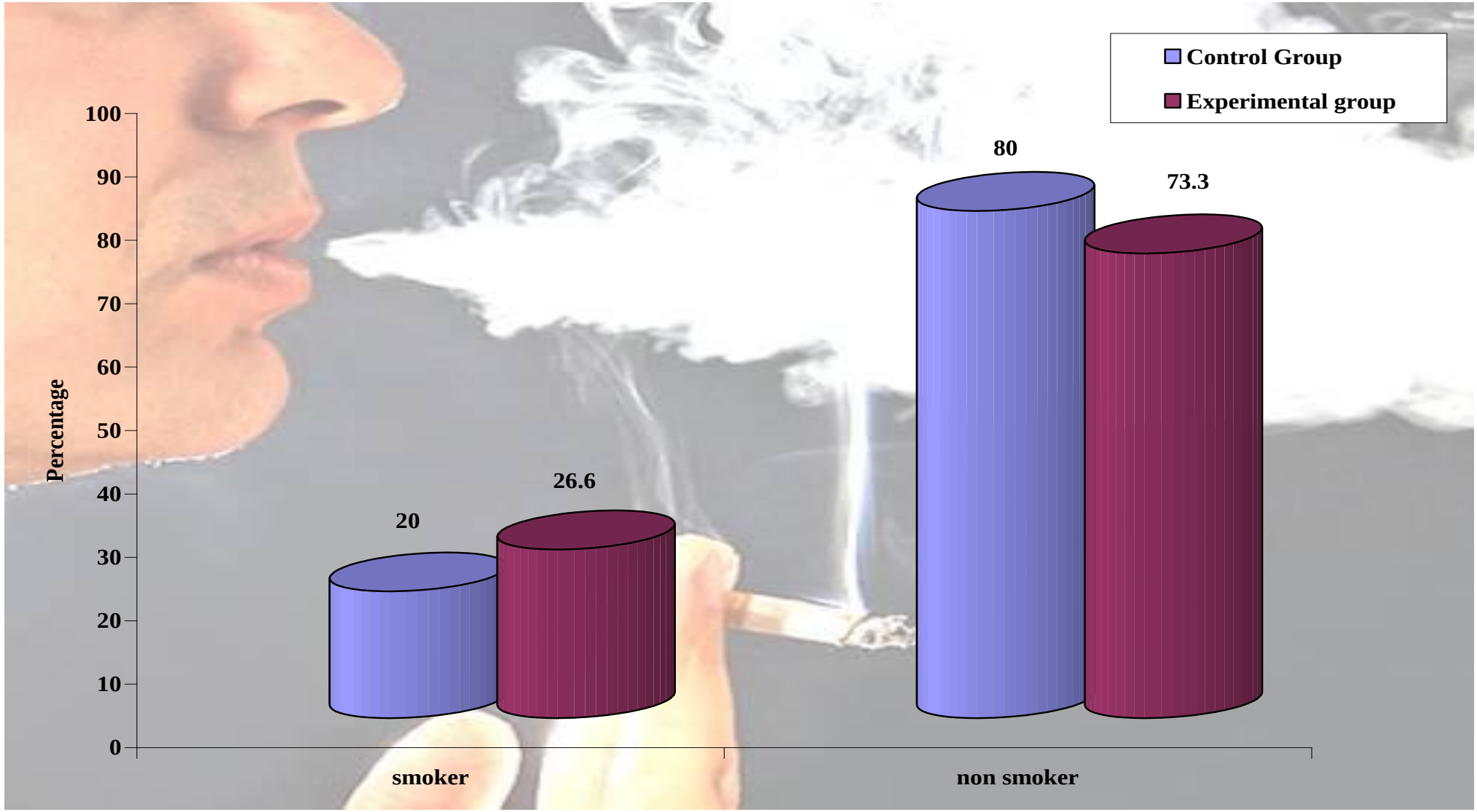


**Fig. 6 Percentage distribution of habit of smoking among hypertensive clients**

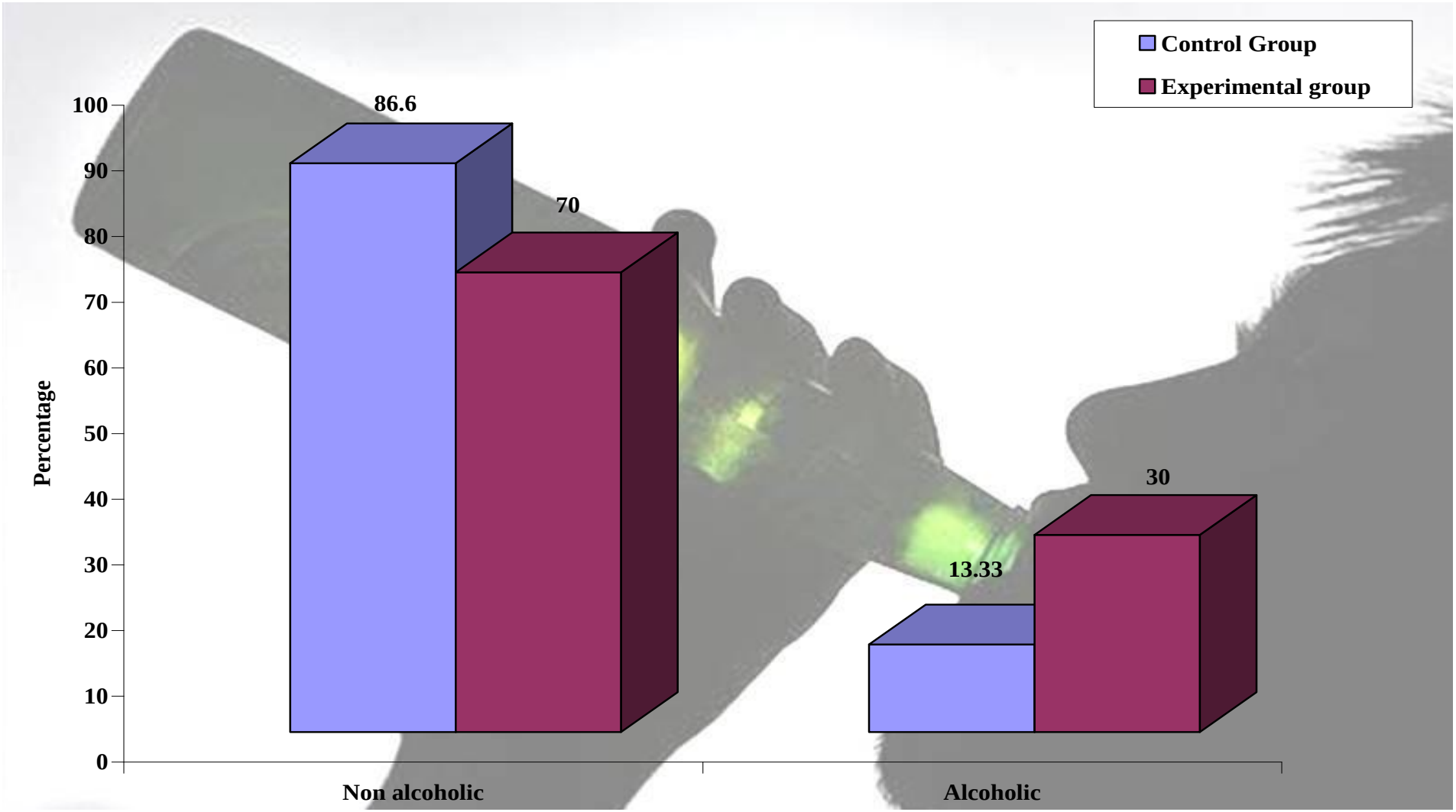


**Fig.7 Percentage distribution of habit of alcoholism among hypertensive clients**

**Table. 3**

**Frequency and Percentage Distribution of Blood pressure Levels of Hypertensive Clients in Control and Experimental Group Before and After Administration of Cucumber juice**

| Level of Blood pressure | Control Group (n=30) | | | | Experimental Group (n=30) | | | |
|---|---|---|---|---|---|---|---|---|
| | Before Cucumber juice administration | | After Cucumber juice administration | | Before Cucumber juice administration | | After Cucumber juice administration | |
| **Systolic blood pressure** | n | p | n | p | n | p | n | p |
| Normal | - | - | 2 | 6.6 | - | - | 26 | 87 |
| Mild | 15 | 50 | 14 | 46.7 | 21 | 70 | - | 13 |
| Moderate | 13 | 43.4 | 14 | 46.7 | 6 | 20 | 4 | - |
| Severe | 2 | 6.6 | - | - | 3 | 10 | - | - |
| **Diastolic blood pressure** | | | | | | | | |
| Normal | - | - | - | - | - | - | 28 | 93.4 |
| Mild | 15 | 50 | 24 | 80 | 13 | 43.4 | 2 | 6.6 |
| Moderate | 11 | 36.6 | 6 | 20 | 12 | 40 | - | - |
| Severe | 4 | 13.4 | - | - | 5 | 16.6 | - | - |

The data presented in Table 3 indicate that majority of the hypertensive clients in the control and experimental group had mild deviations of systolic blood pressure (50%, 70%), and most of them had mild deviations of diastolic blood pressure (50%,

43.4%) before cucumber juice administration. But after cucumber juice administration there was a significant difference in the experimental group, 87% of clients had normal level of systolic blood pressure and 93.4% of clients had normal level of diastolic blood pressure. Where as in the control group 46.7% clients had mild level of systolic blood pressure and 80% of clients had mild level of diastolic blood pressure.

**Table. 4**

**Comparison of Mean and Standard Deviation of Blood Pressure Levels of Hypertensive clients Between Control and Experimental Group before and after administration of Cucumber juice.**

| Blood Pressure level | Control Group (n=30) | | Experimental Group (n=30) | | |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | t value |
| **Systolic blood pressure levels** | | | | | |
| Pre test | 157 | 13.58 | 152 | 13.3 | 1.42 |
| Post test | 152 | 11.3 | 123 | 7.06 | **11.6*** ** |
| **Diastolic blood pressure levels** | | | | | |
| Pre test | 96 | 7.06 | 97 | 7.26 | -0.54 |
| Post test | 90 | 6.62 | 77 | 4.58 | **8.5*** ** |

*** **p<0.001**

Data from table 4, in control group there was no significant difference in the mean and standard deviation of systolic blood pressure (M=157,152 & SD=13.58, 11.3) and diastolic blood pressure level (M=96, 90 & SD=7.06, 6.62) in pre test and post test assessment. Whereas experimental group showed a significant difference ($p<0.001$) in the mean and standard deviation of systolic blood pressure level (M=152, 123 & SD=13.3, 7.06) and diastolic blood pressure level (M=97, 77 & SD=7.26, 4.58) before and after administration of cucumber juice it can be attributed to the effectiveness of cucumber juice. Hence the null hypothesis $Ho_1$ was rejected.

**Table.5**

**Frequency and Percentage Distribution of Level of Satisfaction in Experimental Group after Administration of Cucumber juice**

| Level of satisfaction | Experimental group | | | |
|---|---|---|---|---|
| | Highly satisfied | | Satisfied | |
| | n | p | n | p |
| Researcher | 25 | 83 | 5 | 17 |
| Nature of cucumber juice | 25 | 83 | 5 | 17 |
| Method of administration | 22 | 73 | 8 | 27 |
| Effectiveness of the therapy | 30 | 100 | - | - |

Table 5 shows that majority of the hypertensive clients in the experimental group were highly satisfied with regard to researcher approach and nature of cucumber juice (83%), and most of the hypertensive clients were highly satisfied with regard to method of administration of cucumber juice (73%), and majority of the clients were highly satisfied with regard to the effectiveness of cucumber juice administration (100%) respectively.

**Table.6**

**Association Between Selected Demographic Variables and Level of Systolic Blood Pressure in Pre test and Post test in The Control Group of Hypertensive Clients**

| Demographic variables | Pre test | | | Post test | | |
|---|---|---|---|---|---|---|
| | Upto mean | Above mean | $\chi^2$ | Upto mean | Above mean | $\chi^2$ |
| **Age (in years)** | | | | | | |
| <50 | 2 | 5 | 0.81 | 4 | 3 | 0.022 |
| >50 | 11 | 12 | df =1 | 12 | 11 | df =1 |
| **Gender** | | | | | | |
| Male | 8 | 2 | **8.2*** | 6 | 4 | 0.2678 |
| Female | 5 | 15 | df =1 | 10 | 10 | df =1 |
| **Religion** | | | | | | |
| Hindu | 9 | 12 | 1.03 | 11 | 10 | 0.0255 |
| Christian | 4 | 5 | df =1 | 5 | 4 | df =1 |
| **Education** | | | | | | |
| No formal education | 6 | 11 | **6.4*** | 10 | 7 | 0.475 |
| Literate | 7 | 6 | df =1 | 6 | 7 | df =1 |
| **Income per month** | | | | | | |
| < 10000 | 3 | 4 | **8.43*** | 3 | 4 | 0.42 |
| >10000 | 10 | 13 | df =1 | 13 | 10 | df =1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Occupational Status** | | | | | | |
| Unemployed | 6 | 13 | 3.56 | 7 | 12 | **5.662*** |
| Employed | 7 | 4 | df =1 | 9 | 2 | df =1 |

***p<0.05**

Note: categories under the variables were clubbed for the sake of chi square analysis

Data from table 6 shows that there was a significant association between demographic variable (gender, education, income) and systolic blood pressure level in the pre test and occupational status in the post test. So the null hypothesis $H0_2$ was rejected with regard to gender, education and occupational status.

**Table.7**

**Association between Selected Demographic Variables and Level of Diastolic Blood Pressure in Pre test and Post test in The Control Group of Hypertensive Clients.**

| Demographic variables | Pre test | | | Post test | | |
|---|---|---|---|---|---|---|
| | Upto mean | Above mean | $\chi^2$ | Upto mean | Above mean | $\chi^2$ |
| **Age (in years)** | | | | | | |
| <50 | 3 | 4 | .186 | 5 | 2 | 0.419 |
| >50 | 12 | 11 | df =1 | 19 | 4 | df =1 |
| **Gender** | | | | | | |
| Male | 5 | 5 | 0.6 | 9 | 1 | 0.937 |
| Female | 10 | 10 | df =1 | 15 | 5 | df =1 |
| **Religion** | | | | | | |
| Hindu | 10 | 11 | 0.15 | 19 | 2 | 1.806 |
| Christian | 5 | 4 | df =1 | 5 | 4 | df =1 |
| **Education** | | | | | | |
| No formal | 7 | 10 | 1.2 | 14 | 3 | 0.1357 |
| education | | | df =1 | | | df =1 |
| Literate | 8 | 5 | | 10 | 3 | |
| **Income per month** | | | | | | |
| < 10000 | 4 | 3 | .186 | 5 | 2 | 0.419 |
| >10000 | 11 | 12 | df =1 | 19 | 4 | df =1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Occupational Status** | | | | | | |
| Employed | 11 | 8 | 1.29 | 17 | 2 | 2.906 |
| Unemployed | 4 | 7 | df =1 | 7 | 4 | df =1 |

***p<0.05**

Note: categories under the variables were clubbed for the sake of chi square analysis

Data from table 7 shows that there was no significant association between demographical variables and diastolic blood pressure level in pre test and post test. In this regard the null hypothesis $H0_2$ "There will be no significant association between selected demographic variables and blood pressure levels before and after administration of cucumber juice in control and experimental group of hypertensive clients" was retained.

**Table.8**

**Association between Selected Demographic Variables and Level of Systolic Blood Pressure Before and After Administration of Cucumber Juice in Experimental Group of Hypertensive Clients**

| Demographic variables | Before cucumber juice administration | | | After cucumber juice administration | | |
|---|---|---|---|---|---|---|
| | Upto mean | Above mean | $\chi^2$ | Upto mean | Above mean | $\chi^2$ |
| **Age (in years)** | | | | | | |
| <50 | 2 | 4 | **4.802*** | 5 | 1 | .072 |
| >50 | 19 | 5 | df =1 | 21 | 3 | df =1 |
| **Gender** | | | | | | |
| Male | 7 | 2 | 0.37 | 8 | 1 | .054 |
| Female | 14 | 7 | df =1 | 18 | 3 | df =1 |
| **Religion** | | | | | | |
| Hindu | 16 | 7 | 0.00 | 20 | 3 | 1.16 |
| Christian | 5 | 2 | df =1 | 6 | 1 | df =1 |
| **Education** | | | | | | |
| No formal education | 8 | 5 | 0.872 | 15 | 2 | .08 |
| Literate | 13 | 4 | df =1 | 11 | 2 | df =1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Income per month** | | | | | | |
| < 10000 | 7 | 3 | 0.00 | 8 | 2 | .576 |
| >10000 | 14 | 6 | df =1 | 18 | 2 | df =1 |
| **Occupational Status** | | | | | | |
| Employed | 15 | 3 | .105 | 16 | 2 | .19 |
| Unemployed | 6 | 6 | df =1 | 10 | 2 | df =1 |

***p<0.05**

Note: categories under the variables were clubbed for the sake of chi square analysis

Data from table 8 shows that there was a significant association between demographical variable (age) and systolic blood pressure level in pre test. So the null hypothesis $H0_2$ was rejected with regard to age.

**Table.9**

**Association between Selected Demographic Variables and Level of Diastolic Blood Pressure Before and After Administration of Cucumber Juice in Experimental Group of Hypertensive Clients**

| Demographic variables | Before cucumber juice administration | | | After cucumber juice administration | | |
|---|---|---|---|---|---|---|
| | Upto mean | Above mean | $\chi^2$ | Upto mean | Above mean | $\chi^2$ |
| **Age (in years)** | | | | | | |
| <50 | 2 | 4 | 0.305 | 6 | 0 | .53 |
| >50 | 11 | 13 | df =1 | 22 | 2 | df =1 |
| **Gender** | | | | | | |
| Male | 4 | 5 | 0.00 | 9 | 0 | .91 |
| Female | 9 | 12 | df =1 | 19 | 2 | df =1 |
| **Religion** | | | | | | |
| Hindu | 8 | 15 | 2.93 | 21 | 2 | .163 |
| Christian | 5 | 2 | df =1 | 7 | - | df =1 |
| **Education** | | | | | | |
| No formal education | 4 | 13 | **6.265*** | 17 | - | 2.80 |
| Literate | 9 | 4 | df =1 | 11 | 2 | df =1 |
| **Income per month** | | | | | | |
| < 10000 | 7 | 3 | 3.32 | 8 | 2 | 1.07 |
| >10000 | 14 | 6 | df =1 | 18 | 2 | df =1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Occupational Status** | | | | | | |
| Employed | 15 | 3 | .36 | 16 | 2 | .089 |
| Unemployed | 6 | 6 | df =1 | 10 | 2 | df =1 |

***p<0.05**

Note: categories under the variables were clubbed for the sake of chi square analysis

Data from table 9 shows that there was a significant association between demographical variable (education) and diastolic blood pressure level in pre test. So the null hypothesis $H0_2$ was rejected with regard to education.

**Table.10**

**Association Between Selected Clinical Variables and Level of Systolic Blood Pressure in Pre test and Post test in Control Group of Hypertensive Clients.**

| Clinical Variables | Pre test | | | Post test | | |
|---|---|---|---|---|---|---|
| | Upto mean | Above mean | $\chi^2$ | Upto mean | Above mean | $\chi^2$ |
| **Height** | | | | | | |
| ≤150 | 5 | 15 | .27 | 12 | 8 | 2.85 |
| >150 | 8 | 2 | df=1 | 4 | 6 | df =1 |
| **Weight** | | | | | | |
| ≤50 | 1 | 1 | **9.5**** | 1 | 1 | **9.5**** |
| >50 | 13 | 15 | df=1 | 15 | 13 | df =1 |
| **BMI** | | | | | | |
| <22.9 | 11 | 13 | .30 | 13 | 13 | .075 |
| >22.9 | 2 | 4 | df=1 | 3 | 1 | df =1 |
| **Nature of physical activity** | | | | | | |
| Sedentary | 10 | 10 | 1.08 | 10 | 10 | .26 |
| Moderate | 3 | 7 | df=1 | 6 | 4 | df =1 |
| **History of hypertension** | | | | | | |
| <1yr | 5 | 5 | .27 | 6 | 4 | .26 |
| >1yr | 8 | 12 | df=1 | 10 | 10 | df =1 |
| **Family history of hypertension** | | | | | | |
| No | 7 | 12 | .88 | 10 | 9 | 0.010 |
| Yes | 6 | 5 | df=1 | 6 | 5 | df =1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Drugs** | | | | | | |
| Regularly | 10 | 15 | .677 | 13 | 12 | .107 |
| During discomfort | 3 | 2 | df=1 | 3 | 2 | df =1 |
| **Co-morbidities** | | | | | | |
| No | 8 | 10 | .022 | 11 | 7 | 1.09 |
| Yes | 5 | 7 | df=1 | 5 | 7 | df =1 |
| **Habit of smoking** | | | | | | |
| Smokers | 3 | 3 | .135 | 4 | 2 | .535 |
| non smokers | 10 | 14 | df=1 | 12 | 12 | df=1 |
| **Habit of alcoholism** | | | | | | |
| Alcoholics | 3 | 1 | 1.88 | 2 | 2 | 0.20 |
| Non alcoholics | 10 | 16 | df=1 | 14 | 12 | df=1 |

****p<0.01**

Note: categories under the variables were clubbed for the sake of chi square analysis

Data from table 10 shows that there was a significant association between clinical variable (weight) and systolic blood pressure level in pre test and post test. So the null hypothesis $H0_3$ was rejected with regard to weight.

**Table.11**

**Association Between Selected Clinical Variables and Level of Diastolic Blood Pressure in Pre test and Post test in Control Group of Hypertensive Clients.**

| Clinical Variables | Pre test | | | Post test | | |
|---|---|---|---|---|---|---|
| | Upto mean | Above mean | $\chi^2$ | Upto mean | Above mean | $\chi^2$ |
| **Height** | | | | | | |
| ≤150 | 10 | 10 | 0 | 16 | 4 | 0 |
| >150 | 5 | 5 | df=1 | 8 | 2 | df=1 |
| **Weight** | | | | | | |
| ≤50 | 1 | 1 | 0 | 1 | 1 | 1.2 |
| >50 | 14 | 14 | df=1 | 23 | 5 | df=1 |
| **BMI** | | | | | | |
| <24 | 13 | 11 | **5*** | 20 | 4 | .83 |
| >24 | 2 | 4 | df=1 | 4 | 2 | df=1 |
| **Nature of physical activity** | | | | | | |
| Sedentary | 8 | 12 | 2.4 | 17 | 3 | .93 |
| Moderate | 7 | 3 | df=1 | 7 | 3 | df=1 |
| **History of hypertension** | | | | | | |
| <1yr | 5 | 5 | 0 | 8 | 2 | 0 |
| >1yr | 10 | 10 | df=1 | 16 | 4 | df=1 |
| **Family history of hypertension** | | | | | | |
| No | 8 | 11 | 1.29 | 17 | 2 | 2.9 |
| Yes | 7 | 4 | df=1 | 7 | 4 | df=1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Drugs** | | | | | | |
| Regularly | 12 | 13 | .24 | 21 | 4 | 1.5 |
| During discomfort | 3 | 2 | df=1 | 3 | 2 | df=1 |
| **Co-morbidities** | | | | | | |
| No | 8 | 10 | .55 | 15 | 3 | .31 |
| Yes | 7 | 5 | df=1 | 9 | 3 | df=1 |
| **Habit of smoking** | | | | | | |
| Smokers | 3 | 3 | 0 | 5 | 1 | .05 |
| non smokers | 12 | 12 | df=1 | 19 | 5 | df=1 |
| **Habit of alcoholism** | | | | | | |
| Alcoholics | 1 | 3 | 1.55 | 2 | 2 | 2.5 |
| Non alcoholics | 14 | 12 | df=1 | 22 | 4 | df=1 |

***p<0.05**

Note: categories under the variables were clubbed for the sake of chi square analysis

Data from table 11 shows that there was a significant association between clinical variable BMI and diastolic blood pressure level in pre test. So the null hypothesis $H0_3$ was rejected with regard to BMI.

**Table.12**

**Association between Selected Clinical Variables and Level of Systolic Blood Pressure Before and After Administration of Cucumber Juice in Experimental Group of Hypertensive Clients.**

| Clinical Variables | Before cucumber juice administration | | | After cucumber juice administration | | |
|---|---|---|---|---|---|---|
| | Upto mean | Above mean | $\chi^2$ | Upto Mean | Above mean | $\chi^2$ |
| **Height** | | | | | | |
| ≤150 | 4 | 5 | 2.9 | 6 | 3 | 2.45 |
| >150 | 17 | 4 | df=1 | 20 | 1 | df=1 |
| **Weight** | | | | | | |
| ≤50 | 3 | 3 | 1.42 | 4 | 2 | 2.5 |
| >50 | 18 | 6 | df=1 | 22 | 2 | df=1 |
| **BMI** | | | | | | |
| <22.9 | 19 | 7 | .879 | 23 | 3 | .54 |
| >22.9 | 2 | 2 | df=1 | 3 | 1 | df=1 |
| **Nature of physical activity** | | | | | | |
| Sedentary | 15 | 5 | .7 | 18 | 2 | .576 |
| Moderate | 6 | 4 | df=1 | 8 | 2 | df=1 |
| **History of hypertension** | | | | | | |
| <1yr | 5 | 2 | 2.8 | 4 | 3 | 2.68 |
| >1yr | 16 | 7 | df=1 | 22 | 1 | df=1 |
| **Family history of hypertension** | | | | | | |
| No | 12 | 2 | 3.08 | 11 | 3 | |
| Yes | 9 | 7 | df=1 | 15 | 1 | 1.48 df=1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Drugs** | | | | | | |
| Regularly | 13 | 12 | .107 | 14 | 11 | .67 |
| During discomfort | 3 | 2 | df=1 | 3 | 2 | df=1 |
| **Co-morbidities** | | | | | | |
| No | 11 | 7 | 1.09 | 11 | 7 | 1.09 |
| Yes | 5 | 7 | df=1 | 5 | 7 | df=1 |
| **Habit of smoking** | | | | | | |
| Smokers | 5 | 3 | .29 | 6 | 2 | 1.28 |
| non smokers | 16 | 6 | df=1 | 20 | 2 | df=1 |
| **Habit of alcoholism** | | | | | | |
| Alcoholics | 7 | 2 | .37 | 8 | 1 | .05 |
| Non alcoholics | 14 | 7 | df=1 | 18 | 3 | df=1 |

***p<0.05**

Note: categories under the variables were clubbed for the sake of chi square analysis

Data from table 12 shows that there was no significant association between clinical variables and systolic blood pressure level before and after administration of cucumber juice. So the null hypothesis $Ho_3$ was retained.

**Table.13**

**Association between Selected Clinical Variables and Level of Diastolic Blood Pressure Before and After Administration of Cucumber Juice in Experimental Group of Hypertensive Clients.**

| Clinical Variables | Before cucumber juice administration | | | After cucumber juice administration | | |
|---|---|---|---|---|---|---|
| | Upto mean | Above mean | $\chi^2$ | Upto Mean | Above mean | $\chi^2$ |
| **Height** | | | | | | |
| ≤150 | 1 | 8 | 1.4 | 8 | 1 | .408 |
| >150 | 12 | 9 | df=1 | 20 | 1 | df=1 |
| **Weight** | | | | | | |
| ≤50 | 5 | 1 | 2.8 | 6 | 0 | .37 |
| >50 | 8 | 16 | df=1 | 22 | 2 | df=1 |
| **BMI** | | | | | | |
| <22.9 | 12 | 14 | .63 | 25 | 1 | 2.49 |
| >22.9 | 1 | 3 | df=1 | 3 | 1 | df=1 |
| **Nature of physical activity** | | | | | | |
| Sedentary | 15 | 5 | .71 | 19 | 1 | .26 |
| Moderate | 6 | 4 | df=1 | 9 | 1 | df=1 |
| **History of hypertension** | | | | | | |
| <1yr | 5 | 2 | 2.8 | 7 | 7 | .65 |
| >1yr | 16 | 7 | df=1 | 21 | 2 | df=1 |
| **Family history of hypertension** | | | | | | |
| No | 4 | 10 | 2.32 | 13 | 1 | 1.5 |
| Yes | 9 | 7 | df=1 | 15 | 1 | df=1 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Drugs** | | | | | | |
| Regularly | 10 | 15 | .67 | 10 | 15 | .67 |
| During discomfort | 3 | 2 | df=1 | 3 | 2 | df=1 |
| **Co-morbidities** | | | | | | |
| No | 8 | 10 | .02 | 8 | 10 | .02 |
| Yes | 5 | 7 | df=1 | 5 | 7 | df=1 |
| **Habit of smoking** | | | | | | |
| Smokers | 5 | 3 | .163 | 7 | 1 | .596 |
| non smokers | 8 | 14 | df=1 | 21 | 1 | df=1 |
| **Habit of alcoholism** | | | | | | |
| Alcoholics | 6 | 3 | 2.8 | 9 | 0 | .918 |
| Non alcoholics | 7 | 14 | df=1 | 19 | 2 | df=1 |

***p<0.05**

Note: categories under the variables were clubbed for the sake of chi square analysis

Data from table 13 shows that there was no significant association between clinical variables and diastolic blood pressure level in before and after administration of cucumber juice. So the null hypothesis $Ho_3$ was retained.

## Summary

This chapter has dealt with analysis and interpretation of the data obtained by the researcher. The analysis of the data using descriptive and inferential statistics clearly revealed the effectiveness of cucumber juice upon blood pressure levels in hypertensive clients. In the following chapter interpretation of the study findings are discussed in detail.

# CHAPTER V

# DISCUSSION

Data relevant to the research findings were presented in chapter IV. Discussion of these results and these implications are presented in two sections: an investigation of the data regarding the research hypotheses is followed by presentation implications for further research.

## Statement of the Problem

A Quasi Experimental Study To Assess The Effectiveness Of Cucumber Juice Upon Blood Pressure Level In Hypertensive Clients At Selected Wards Of Thiruverkadu Township, Chennai.

## Objectives of the study

1. To assess the blood pressure level before and after administration of cucumber juice in control and experimental group of hypertensive clients
2. To determine the effectiveness of cucumber juice upon blood pressure level by comparing the blood pressure level before and after administration of cucumber juice in control and experimental group of hypertensive clients.
3. To determine the level of satisfaction regarding cucumber juice administration among experimental group of hypertensive clients.
4. To find out the association between the selected demographic variables and blood pressure level before and after administration of cucumber juice in control and experimental group of hypertensive clients.

5. To find out the association between the selected clinical variables and blood pressure level before and after administration of cucumber juice in control and experimental group of hypertensive clients.

A quasi experimental design was adopted for this study. Purposive sampling technique was used to select 30 in control group from 14$^{th}$ ward of Thiruverkadu Township and 30 in experimental group from Keelayanambakkam. The blood pressure assessment chart and rating scale for level of satisfaction on administration of cucumber juice were the tools used to collect data, after establishing validity and reliability. The main data collection was done after determining the feasibility and practicability through pilot study.

The hypertensive clients were identified by screening. The blood pressure level was checked for both control and experimental group before and after administration of cucumber juice. Cucumber juice was freshly prepared in a juicer. 125ml of this was administered every day orally on empty stomach for four weeks and their level of satisfaction on cucumber juice was assessed. The data was tabulated and analyzed by using descriptive and inferential statistics.

**The discussion is presented under the following headings:**

- Frequency and percentage distribution of demographic variables and clinical variables control and experimental of hypertensive clients
- Frequency and percentage distribution of systolic and diastolic blood pressure levels before and after administration of cucumber juice in the control and experimental group of hypertensive clients

- Comparison of mean and standard deviation of blood pressure levels before and after administration of cucumber juice between control and experimental group of hypertensive clients
- Frequency and percentage distribution of level of satisfaction in experimental group of hypertensive clients regarding cucumber juice administration.
- Association between the selected demographic variables and level of blood pressure before and after administration of cucumber juice in control and experimental group of hypertensive clients
- Association between the selected clinical variables and level blood pressure before and after administration of cucumber juice in control and experimental group of hypertensive clients

**Frequency and Percentage Distribution of Demographic Variables of Control and Experimental Group of Hypertensive Clients**

Majority of hypertensive clients were in age group of 51to70 (76.6%,80%), were females (66.7%,70%), belonging to Hindu religion (70%,76.6%), married (100%,100%) and a significant percentage of hypertensive clients had no formal education (43.3%,43.4%),occupational status as home makers (36.6%,40%), with monthly income of 10001-15000 (40%,33.3%), in control and experimental group respectively.

Clients with hypertension were influenced by some of the variables. It was found that the hypertensive clients were above the age of 50 years; this finding was supported with the research conducted by Wenyue Pang et al., (2010) which revealed that the prevalence rates of hypertension are 57%, 64.4% and 64.9% for the age groups

60-69, 70-79 and ≥ 80 years, respectively. Thus we can infer that as the age rises, the blood pressure also increases. It helps the nurses to concentrate more on this age group to reduce the morbidity and mortality related to increase in the blood pressure levels.

In this study most of the clients were illiterates, shows that literacy rate in India is low in rural area when compared to urban, this may be due to lack of awareness ,access to facilities. Prevalence of hypertension was highest in illiterate people; it could be due to better awareness regarding the measures to control hypertension in educated than uneducated people. This was consistent with a study by Cihangir et al. (2009) who found that prevalence of hypertension was highest in illiterate people and lowest in people who graduated from universities.

In this study most of the clients were in the middle income group. This was supported with a study conducted by R Deepa et al. (2003) who found that analysis on the different social classes revealed that the prevalence, awareness and treatment of hypertension to be significantly higher among the middle income group compared to lower income group. The prevalence of hypertension went on increasing significantly with increase in socio-economic status and with increase in literacy status.

**Frequency and Percentage Distribution of Demographic Variables of Control and Experimental Of Hypertensive Clients**

Majority of the hypertensive clients had been suffering from hypertension for a duration between 1 to 5 yrs (66.7%, 76.6%), had no family history of hypertension (63.3%, 46.6%), were on oral anti hypertensive agents (83.3%, 90%), had body weight between 51-60 kg (50%, 46.67%), with height 151 to 160 cm (43.3%, 67%), with BMI

between 19 to 24 (80%, 83.33%), non vegetarians (46.6%, 56.67%), sedentary workers (66.75, 66.7%) absence of co morbidities (60%, 50%), not on other alternative or complementary therapy (100%, 100%), had no habit of smoking (80%, 73.3%) and had no habit of alcoholism (86.6%, 70%) in control and experimental group respectively.

Alcoholism, smoking, increased body mass index are considered to be the risk factors for hypertension, but in this study most of the hypertensive clients were non smokers ,non alcoholics, and with BMI of 18.5-22.9.70% of the subjects in this study were females. As per culture and tradition the rural Indian females don't smoke and indulge in drinking alcohol. More over they were doing house hold cores and also had activities in the work place which might have contributed to their normal range of BMI. Changing lifestyle factors has documented efficacy in the primary prevention and control of hypertension.

In the present study, majority of them were taking anti hypertensive medications regularly. Significant percentage of them had habit of taking non vegetarian diet twice in a week. It is due to high cholesterol content in non vegetarian diet which plays significant role in increasing the level of blood pressure. In addition to medical management complementary therapies also plays an important role in the reduction of hypertension. In home based set up dietary approach is essential in management of hypertension. Vegetables have a greater effect on hypertension due to the presence of potassium, magnesium, vitamin C etc. Cucumber (cucumis sativa) has over eighty nutrients which include vitamin A, B1, B2, B3, C and the minerals silica and molybdenum. Water and mineral content of potassium in cucumber will remove excess uric acid and metabolic wastes through the kidneys, and is effective in the control of

high blood pressure It is the responsibility of the nurses to educate the importance of dietary management for hypertensive clients.

**Frequency and Percentage Distribution of Systolic and Diastolic Blood Pressure Levels Before and After Administration of Cucumber Juice In The Control And Experimental Group Of Hypertensive Clients**

Majority of the hypertensive clients in the control and experimental group had mild deviations of systolic blood pressure (50%, 70%), and most of them had mild deviations of diastolic blood pressure (50%, 43.4%) before cucumber juice administration. But after cucumber juice administration there was a significant difference in the experimental group, 87% of clients had normal level of systolic blood pressure and 93.4% of clients had normal level of diastolic blood pressure. Where as in the control group 46.7% clients had mild level of systolic blood pressure and 80% of clients had mild level of diastolic blood pressure.

This could be attributed to the effectiveness of cucumber juice administration. Approach to stop Hypertension (DASH), conducted scientific studies to ascertain the value of cucumber in the control of high blood pressure. In the studies the blood pressure of those who took part in research lowered their systolic reading by 5.5 points and their diastolic reading by 3.0 points.

Thus the researcher concluded that the mild and moderate level of blood pressure level can be brought to normal if appropriate measures are taken. Hence all the community health nurses must be trained regarding alternative therapies, so that they can disseminate the knowledge to public.

**Comparison of Mean and Standard Deviation of Blood Pressure Levels Before And After Administration Of Cucumber Juice Between Control And Experimental Group Of Hypertensive Clients**

In control group there was no significant difference in the mean and standard deviation of systolic blood pressure (M=157,152 & SD=13.58, 11.3) and diastolic blood pressure level (M=96, 90 & SD=7.06, 6.62) in pre test and post test assessment. Whereas experimental group showed a significant difference ($p<0.001$) in the mean and standard deviation of systolic blood pressure level (M=152, 123 & SD=13.3, 7.06) and diastolic blood pressure level (M=97, 77 & SD=7.26, 4.58) before and after administration of cucumber juice it can be attributed to the effectiveness of cucumber juice. Hence the null hypothesis $Ho_1$ was rejected.

This shows that Cucumber juice is rich in potassium and magnesium, and its water content is 90%, so it was great as a natural remedy for hypertension. So, it is a very cost effective way of offsetting health problem related to hypertension.

**Frequency and Percentage Distribution of Level of Satisfaction in Experimental Group of Hypertensive Clients Regarding Cucumber Juice Administration**

Majority of the hypertensive clients in the experimental group were highly satisfied with regard to researcher approach and nature of cucumber juice (83%), and most of the hypertensive clients were highly satisfied with regard to method of administration of cucumber juice (73%), and majority of the clients were highly satisfied with regard to the effectiveness of cucumber juice administration (100%) respectively.

This finding indicated that the administration of cucumber juice is effective in reducing the blood pressure level, since it is easy to administer, harmless, easily

available and cost effective. So the community health nurse can administer to the clients with moderate hypertension without any harmful effect.

**Association between the Selected Demographic Variables and Level of Blood Pressure Before and After Administration of Cucumber Juice in Control and Experimental Group of Hypertensive Clients**

There was a significant association between the selected demographic variables of gender ($\chi^2$=8.2, df=1), education ($\chi^2$=6.4, df=1), income ($\chi^2$=8.43, df=1) and systolic blood pressure levels of hypertensive clients in pretest, and occupational status ($\chi^2$=5.56, df=1) in post test at ($p<0.05$) in the control group, but there was no significant association with other demographic variables. Hence the null hypothesis $Ho_2$ was rejected with regard to gender, education, income and occupational status. There was a significant association between demographical variable age ($\chi$2=4.80, df=1) and systolic blood pressure level in pretest and post test at ($p<0.05$) in the experimental group. So the null hypothesis $H0_2$ was rejected with regard to age.

This inferred that risk of incidence of hypertension increases with age. So old age group has to be concentrated and educated regarding hypertension.

There was a significant association between demographical variable education ($\chi^2$=6.26, df=1) and diastolic blood pressure level in pre test at ($p<0.05$). So the null hypothesis $H0_2$ was rejected with regard to education.This finding was supported by Kouvonen (2008) which showed that unemployment increases the risk of premature mortality by 63 percent.

The study findings found that most of them were females in both the control and experimental group. This was in par with a study conducted by Feng Hwa Lu etal,(2000)which identified that the prevalence of hypertension was higher in women(61.9%)than in men(59.1%).This throws light to the fact that hypertension was more prevalent in females than males in the elderly people. It could be due to the hormonal and biochemical changes after menopause that might have an effect on blood pressure and leads to increased prevalence of hypertension among the females.

**Association between the Selected Clinical Variables and Level Blood Pressure Before and After Administration of Cucumber Juice in Control and Experimental Group of Hypertensive Clients**

There was a significant association between the selected clinical variable weight ($\chi^2$=9.5, df=1) ($p<0.01$) and systolic blood pressure levels of hypertensive clients in pre test and post test in control group, but there was no significant association with other clinical variables. Hence the null hypothesis $Ho_3$ was rejected with regard to weight.

There was a significant association between the selected clinical variable BMI ($\chi^2$=5, df=1) ($p<0.05$) and diastolic blood pressure levels of hypertensive clients in pre test in control group, but there was no significant association with other clinical variables. Hence the null hypothesis $Ho_3$ was rejected with regard to BMI.

Based on epidemiology, the significant increase in the number of people who are obese corresponds with the increase in hypertension prevalence. A linear relationship has been found between excessive weight and elevated blood pressures, although this relationship differs among races. Therefore, as the magnitude of weight gain increases, the BP also rises. But in this study majority of the subjects were in the normal range of

weight and BMI. More over they were doing house hold cores and also had activities in the work place which might have contributed to their normal range of BMI.

## Summary

This chapter has dealt with the objectives of the study, major findings of the demographic and clinical variables, comparison of systolic and diastolic blood pressure level of hypertensive clients before and after administration of cucumber juice in control and experimental group, association between selected demographic variables and clinical variables with the systolic and diastolic blood pressure of hypertensive clients in both the groups and the level of satisfaction regarding cucumber juice administration.

# CHAPTER VI

# SUMMARY, CONCLUSION, NURSINGIMPLICATIONS AND RECOMMENDATIONS

The heart of the research project lies in reporting the findings. This is the most creative and demanding part of the study. This chapter gives a brief account of the present study, suggestions of the study and nursing implications. The present study was intended to analyze the effectiveness of cucumber juice upon blood pressure level of hypertensive clients.

## Summary

### Statement of the Problem

A Quasi Experimental Study To Assess The Effectiveness Of Cucumber Juice Upon Blood Pressure Level In Hypertensive Clients At Selected Wards Of Thiruverkadu Township, Chennai.

### Objectives of the Study

1. To assess the blood pressure level before and after administration of cucumber juice in control and experimental group of hypertensive clients
2. To determine the effectiveness of cucumber juice upon blood pressure level by comparing the blood pressure level before and after administration of cucumber juice in control and experimental group of hypertensive clients.
3. To determine the level of satisfaction regarding cucumber juice administration among experimental group of hypertensive clients.

4. To find out the association between the selected demographic variables and blood pressure level before and after administration of cucumber juice in control and experimental group of hypertensive clients.
5. To find out the association between the selected clinical variables and blood pressure level before and after administration of cucumber juice in control and experimental group of hypertensive clients.

**Null Hypotheses**

$Ho_{1:}$ There will be no significant difference in the blood pressure level before and after administration of cucumber juice in control and experimental group of hypertensive clients

$Ho_2$: There will be no significant association between selected demographic variables and blood pressure level before and after administration of cucumber juice in control and experimental group of hypertensive clients

$Ho_3$: There will be no significant association between selected clinical variables and blood pressure level before and after administration of cucumber juice in control and experimental group of hypertensive clients

The conceptual frame work was based on Weidenbach's Helping Art of Clinical Nursing theory which was modified for the present study, and extensive review of literature and guidance by expert formed the foundation of development of the research tool.

A quasi experimental design was adopted for this study. Purposive sampling technique was used to select 30 in control group from $14^{th}$ ward of Thiruverkadu

Township and 30 in experimental group from Keelayanambakkam. The blood pressure assessment chart and rating scale for level of satisfaction on administration of cucumber juice extract were the tools used to collect data, after establishing validity and reliability. The main data collection was done after determining the feasibility and practicability through pilot study.

The hypertensive clients were identified by screening. The blood pressure level was checked for both control and experimental group before and after administration of cucumber juice. . Cucumber juices were freshly prepared in a juicer. 125ml of juice was administered every day orally on empty stomach for four weeks and their level of satisfaction on cucumber juice was assessed. The data was tabulated and analyzed by using descriptive and inferential statistics.

## The Major Findings of the Study

### Demographic Variables of Hypertensive Clients

Majority of hypertensive clients were in age group of 51to70 (76.6%,80%), were females (66.7%,70%), belonging to Hindu religion (70%,76.6%), married (100%,100%) and a significant percentage of hypertensive clients had no formal education (43.3%,43.4%),occupational status as home makers (36.6%,40%), with monthly income of 10001-15000 (40%,33.3%), in control and experimental group respectively.

### Clinical Variables of Hypertensive Clients

Majority of the hypertensive clients had been suffering from hypertension for a duration between 1 to 5 yrs (66.7%, 76.6%), had no family history of hypertension

(63.3%, 46.6%), were on oral anti hypertensive agents (83.3%, 90%), had body weight between 51-60 kg (50%, 46.67%), with height 151 to 160 cm (43.3%, 67%), with BMI between 19 to 24 (80%, 83.33%), non vegetarians (46.6%, 56.67%), sedentary workers (66.75, 66.7%) absence of co morbidities (60%, 50%), not on other alternative or complementary therapy (100%, 100%), had no habit of smoking (80%, 73.3%) and had no habit of alcoholism (86.6%, 70%) in control and experimental group respectively.

**Level of Blood Pressure in Control and Experimental Group of Hypertensive Clients Before and After Cucumber Juice Administration**

Majority of the hypertensive clients in the control and experimental group had mild deviations of systolic blood pressure (50%, 70%), and most of them had mild deviations of diastolic blood pressure (50%, 43.4%) before cucumber juice administration. But after cucumber juice administration there was a significant difference in the experimental group, 87% of clients had normal level of systolic blood pressure and 93.4% of clients had normal level of diastolic blood pressure. Where as in the control group 46.7% clients had mild level of systolic blood pressure and 80% of clients had mild level of diastolic blood pressure.

In control group there was no significant difference in the mean and standard deviation of systolic blood pressure (M=157,152 & SD=13.58, 11.3) and diastolic blood pressure level (M=96, 90 & SD=7.06, 6.62) in pre test and post test assessment. Whereas experimental group showed a significant difference ($p<0.001$) in the mean and standard deviation of systolic blood pressure level (M=152, 123 & SD=13.3, 7.06) and diastolic blood pressure level (M=97, 77 & SD=7.26, 4.58) before and after

administration of cucumber juice it can be attributed to the effectiveness of cucumber juice. Hence the null hypothesis $Ho_1$ was rejected.

**Level of Satisfaction up on Cucumber Juice Administration**

Majority of the hypertensive clients in the experimental group were highly satisfied with regard to researcher approach and nature of cucumber juice (83%), and most of the hypertensive clients were highly satisfied with regard to method of administration of cucumber juice (73%), and majority of the clients were highly satisfied with regard to the effectiveness of cucumber juice administration (100%) respectively.

**Association between the Selected Demographic Variables and Level of Blood Pressure Before and After Administration of Cucumber Juice in Control and Experimental Group of Hypertensive Clients**

There was a significant association between the selected demographic variables of gender ($\chi^2$=8.2, df=1), education ($\chi^2$=6.4, df=1), income ($\chi^2$=8.43, df=1) and systolic blood pressure levels of hypertensive clients in pretest, and occupational status ($\chi^2$=5.56, df=1) in post test at ($p<0.05$) in the control group, but there was no significant association with other demographic variables. Hence the null hypothesis $Ho_2$ was rejected with regard to gender, education, income and occupational status. There was a significant association between demographical variable age ($\chi$2=4.80, df=1) and systolic blood pressure level in pretest and post test at ($p<0.05$) in the experimental group. So the null hypothesis $H0_2$ was rejected with regard to age. There was a significant association between demographic variable education ($\chi^2$=6.26, df=1) and diastolic blood pressure level in pre test at ($p<0.05$). So the null hypothesis $H0_2$ was rejected with regard to education.

**Association between the Selected Clinical Variables and Level Blood Pressure Before and After Administration of Cucumber Juice in Control and Experimental Group of Hypertensive Clients**

There was a significant association between the selected clinical variable weight ($\chi^2$=9.5, df=1) ($p<0.01$) and systolic blood pressure levels of hypertensive clients in pre test and post test in control group, but there was no significant association with other clinical variables. Hence the null hypothesis $Ho_3$ was rejected with regard to weight. There was a significant association between the selected clinical variable BMI ($\chi^2$=5, df=1) ($p<0.05$) and diastolic blood pressure levels of hypertensive clients in pre test in control group, but there was no significant association with other clinical variables. Hence the null hypothesis $Ho_3$ was rejected with regard to BMI.

## Conclusion

There is a wide variety of complementary and alternative therapies which helps in reduction of blood pressure level. One of which is the cucumber juice having anti hypertensive property in it. It can be incorporated into the conventional care and practice. And the researcher too felt the result in her present study, concluded that cucumber juice was effective in reducing the systolic and diastolic blood pressure level. Hence complementary therapy is becoming more even integrated into the existing conventional care and is having both direct and indirect effect in general health care provision.

## Implications

The researcher has derived from the study, the following implications which are of vital concern in the field of nursing practice, nursing education, nursing administration and nursing research.

### Nursing service

The community health nurse has a vital role in the health education of patients about various healthy habits. The nurse should educate the patients to take cucumber juice along with oral anti hypertensive agents to control hypertension. We need evidence based practice in managing clients with hypertension. So, the nurse can be a part of it. Also, the nurse as a team leader, can plan and co-ordinate the activities for the clients, so that the incidence of hypertension can be reduced. Nurses have to give due importance to clients with hypertension and chronic conditions associated with it, so that early screening need to be done to prevent the complications, and nutritional supplementation such as cucumber juice can be given to reduce the hypertension. Health care provider can also re-evaluate the traditional practices.

With emerging health care trends nurses must also know about the nutritional supplements, its benefits and its availability. This helps the clinical nurses to use and recommend cucumber juice to control hypertension which in turn prevents major diseases like cardiovascular disease, neuropathy, nephropathy etc. We need to encourage the students to conduct health camp for the elderly to detect their problems at the earliest.

**Nursing education**

The nurse educators should suitably involve the concepts of herbal medicine in the medical and nursing profession. Nurses should have knowledge about the factors, which enhance and reduce the blood pressure level. Nurses can be educated about the locally available cucumber juices which have a anti hypertensive effect.

Integration of theory and practice is a vital need and it is important in nursing education. Complementary alternative medicine has been included in the curriculum of nursing education. But it is not practiced during their practice in the hospital. Hence the nurse educator can lay emphasis on the complementary alternative medicine for hypertension and its relation to client's recovery.

With changing health trends, nursing education must lay emphasis on nutritional therapy such as cucumber juice administration in reducing hypertension. Nursing educators should emphasize on various nutritional supplements and its health promoting properties.

**Nursing administration**

In today's technological advances and the ever growing challenges of the health care needs, the administrator have the highest responsibility in proving the nurses with substantive continuing education opportunities in the alternative therapy. This will enable the nurses to update their knowledge, acquire special skills in managing the clients with hypertension and demonstrate high quality care.

Nurse administrator should take initiative and periodically organize continuing nursing education programmes for the nurses on control of blood pressure by using natural home remedies. These programmes can be conducted for the nursing personnel

both in the hospital and community settings with modern technological visual aids in order to gain adequate knowledge regarding non pharmacological ways of reducing the incidence of hypertension.

Nurse administrator should take adequate steps with the growing bodies in formulating policies and protocols in providing patient education and plans for man power, money, material, methods and time to conduct successful and useful patient education programmes. Nurse administrator should provide opportunity for the nurses to attend the various training programmes.

**Nursing research**

As a result of growing demand, there is a heightened urgency to expand the evidence base to support the use of cucumber juice. There is a need for extensive and intensive research in this area to generate more specific data base and to identify the benefits of the therapies and provide much needed information for the consumers and providers. It opens a big avenue for research on innovative, alternative methods to reduce the hypertension. Further researches need to be conducted to help the hypertensive clients to come out of their health problems. The professional and student nurses can conduct further studies on the impact of various alternative methods for treating the clients with hypertension, so as to generate more scientific base on which new strategies for reducing the risk of complications are developed.

The nursing students can be encouraged for further nursing research studies on the effectiveness of cucumber juice in controlling the hypertension. Dissemination of the findings can be done through conference, seminar, publication in professional, national, international journals and World Wide Web. More research needs to be

conducted with the use of locally available resources in reducing the hypertension. More theories can be generated based on the research findings.

## Recommendations

The researcher recommends the following studies in the field of nursing research

- The same study could be conducted on larger samples for better generalization.
- The study could be replicated in different settings.
- A study could be conducted to assess the level of knowledge among nurses regarding the administration of cucumber juice for the management of the clients with hypertension.
- A similar study can be conducted with other traditional and herbal medicines.

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## APPENDIX I

## LETTER TO SEEKING PERMISSION TO CONDUCT THE STUDY AND PERMITTING TO CONDUCT THE STUDY

**Apollo College of Nursing**

*(Recognised by the Indian Nursing Council and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)*

***CO/0305/12*** ***11.06.2012***

*To*

*The Chairman,*
*Thiruverkadu Township,*
*Thiruverkadu,*
*Chennai 77.*

*Respected Sir / Madam,*

***Sub.:*** *To request permission for research study – Reg.*

***Greetings!*** *As part of the curriculum requirement our 2nd year M. Sc. (N) student Ms. Kochurani Benny has selected the following title for her research study.*

***"A Quasi experimental study to assess the effectiveness of cucumber juice up on blood pressure level in hypertensive clients at selected wards of Thiruverkadu, Chennai".***

*So I kindly request your good selves to permit her to conduct study in your Township.*

*Thanking You,*

***Dr. LATHA VENKATESAN***
***PRINCIPAL***

து. மகேந்திரன், B.A.,
தலைவர்
திருவேற்காடு நகராட்சி,
சென்னை-600 077.

*IS/ISO 9001:2000*

Vanagaram to Ambattur Main Road, Ayanambakkam, Chennai - 600 095.
Ph. : 044 - 2653 4387 Tele fax : 044 - 2653 4923 / 044- 2653 4386

## APPENDIX II

## ETHICAL COMMITTEE CLEARANCE LETTER

**Ethics Committee**

Apollo HOSPITALS TOUCHING LIVES

30th August 2012

To,

Ms. Kochurani Benny,
2nd Year M.SC (Nursing),
Department of Community Health Nursing,
Apollo College of Nursing,
Chennai.

**Ref:** A Quasi experimental study to assess the effectiveness of cucumber juice upon blood pressure level in hypersensitive clients at selected wards of Thiruverkadu, Chennai.

Sub: Approval of the above referenced project and its related documents.

Dear Ms. Kochurani Benny,

Ethics Committee-Apollo Hospitals has received the following document submitted by you related to the conduct of the above-referenced study.

- Project proposal.
- Participant consent form.

The Ethics Committee-Apollo Hospitals reviewed and discussed the study proposal documents submitted by you related to the conduct of the above referenced study at its meeting held on 29th August 2012.

The following Ethics Committee Members were present at the meeting held on 29th August 2012.

| Name | Profession | Position in the committee |
|---|---|---|
| Mr. S. S. Narayanan | Ethicist | Chairman |
| Dr. Rema Menon | Clinician | Member Secretary |
| Dr. Radha Rajagopalan | Clinician | EC-Member |
| Dr. Krishnakumar | Clinician | EC-Member |
| Dr. Vijaya Kumar | Clinician | EC-Member |
| Dr. Clive Fernandes | Consultant Clinical Pharmacologist | Basic Medical Scientist |
| Dr. Nalini Roa | Social Worker | EC-Member |

Apollo Hospitals Enterprise Limited
21, Greams Lane, Off Greams Road, Chennai - 600 006
Tel : 91 - 44 - 2829 3333 Extn : 6008, 91 - 44 - 2829 5465 Extn : 6639 Fax : 91 - 44 - 2829 4449
E - Mail : ecapollochennai@gmail.com

# Ethics Committee

Apollo HOSPITALS
TOUCHING LIVES

| | | |
|---|---|---|
| Ms. N. Suseela | Retired English Teacher | Layperson |
| Ms. Maimoona Badsha | Lawyer | Lawyer |
| Dr. Paul Dilipkumar | Clinician | EC-Member |
| Dr. V. Balaji | Clinician | EC-Member |
| Dr. M. A. Raja | Consultant Medical Oncologist | EC-Member |

After due ethical and scientific consideration, the Ethics Committee has approved the above presentation submitted by you.

The EC review and approval of the report is only to meet their academic requirement and will not amount to any approval of their conclusions / recommendations as conclusive, deserving adoption and implementation, in any form, in any healthcare institution.

The Ethics Committee is constituted and works as per ICH-GCP, ICMR and revised Schedule Y guidelines.

With Regards,

Date:
30/8/12

Dr. Rema Menon,
Ethics Committee-Member Secretary,
Apollo Hospitals, Chennai,
Tamil Nadu, India.

Dr. REMA MENON
MEMBER SECRETARY
ETHICS COMMITTEE, APOLLO HOSPITALS
APOLLO HOSPITALS ENTERPRISE LIMITED
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## APPENDIX III

## PLAGIARISM ORIGINALITY REPORT

**Plagiarism Detector - Originality Report**

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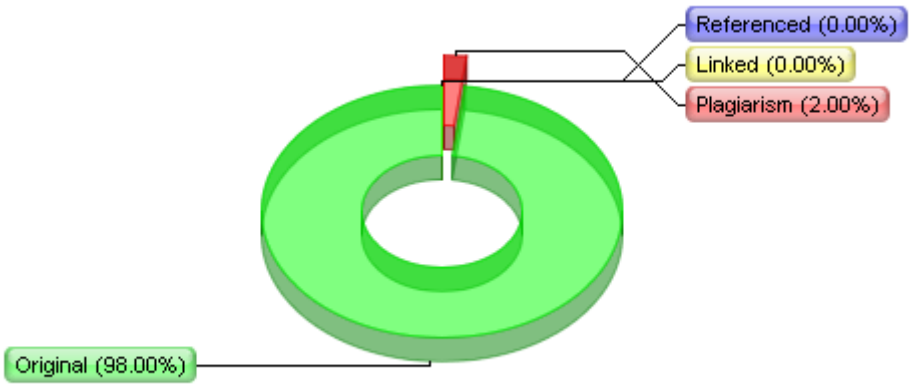


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**Referenced 0% / Linked 0%**

**Original - 98% / 2% - Plagiarism**

## APPENDIX IV

## LETTER REQUESTING OPINIONS AND SUGGESTIONS OF EXPERTS FOR ESTABLISHING CONTENT VALIDITY OF RESEARCH TOOL

From
Kochurani Benny,
M.Sc., (Nursing) Second Year,
Apollo College of Nursing,
Chennai - 600095.

To
Forwarded Through:
Dr. Latha Venkatesan,
Principal,
Apollo College of Nursing.

Sub: **Requesting for opinions and suggestions of experts for establishing content validity for Research tool**.

Respected Madam,

I am a postgraduate student of the Apollo College of Nursing. I have selected the below mentioned topic for research project to be submitted to The Tamil Nadu Dr. M.G.R Medical University, Chennai as a partial fulfilment of Masters of Nursing Degree.

**TITLE OF THE TOPIC:**

An Experimental Study to assess the Effectiveness of Cucumber juice upon Blood Pressure Level of Hypertensive Clients in Selected wards of Thiruverkadu Township, Chennai.

With regards may I kindly request you to validate my tool for its appropriateness and relevancy. I am enclosing the Background, Need for the study, Statement of the problem; Objectives of the study, Demographic Variable Proforma, clinical Variable Proforma, Observational check list, and Rating Scale on Level of Satisfaction of client with hypertension on administration of cucumber juice upon blood pressure for your reference. I would be highly obliged and remain thankful for your great help if you could validate and send it as soon as possible.

**Thanking you,**

**Yours sincerely,**
**(**Kochurani Benny**)**

## APPENDIX V

## LIST OF EXPERTS FOR CONTENT VALIDITY OF THE TOOL

**1. Dr. Latha Venkatesan, M.Sc (N)., M.Phil (N)., Ph.D (N).,**
Principal,
Apollo College of Nursing,
Chennai – 95.

**2. Prof. Mrs. Lizy Sonia.A, M.Sc (N)., Ph.D (N).,**
Vice Principal,
Apollo College of Nursing,
Chennai – 95.

**3. Mrs.Sasikala.D, M.Sc (N).,**
Reader,
Apollo College of Nursing,
Chennai-95.

**5. Mrs. Shobana.G, M.Sc (N).,**
Professor,
Apollo College of Nursing,
Chennai – 95.

**6. Mrs. Jaslina Gnanarani. J, M.Sc (N)., Ph.D (N).,**
Reader,
Apollo College of Nursing,
Chennai – 95.

**7. Mrs.Helen.B, M.Sc (N).,**
Reader,
Apollo College of Nursing,
Chennai – 95.

**8. Mrs. Shenbahavalli.V, M.Sc (N).,**
Lecturer,
Apollo College of Nursing,
Chennai – 95.

## APPENDIX VI

## CONTENT VALIDITY CERTIFICATE

I hereby certify that I have validated the research tool of Ms.Kochurani Benny M.Sc (Nursing) student who is undertaking research study **. "An Experimental Study to assess the Effectiveness of Cucumber juice upon Blood pressure Level of Hypertensive Clients in Selected wards of Thiruverkadu Township, Chennai."**

**.**

Signature of Expert

## APPENDIX VII

## RESEARCH PARTICIPANT CONSENT FORM

Dear participant,

I am Kochurani Benny, M.Sc Nursing student of Apollo College of Nursing, Chennai. As part of my study, a research on "**Effectiveness of cucumber juice upon the level of blood pressure".** The findings of the study will be helpful in reducing the blood pressure in hypertensive clients.

I hereby seek your consent and co-operation to participate in the study. Please be frank and honest in your responses. The information collected will be kept confidential and anonymity will be maintained.

Signature of the researcher

I ……. Hereby consent to participate and undergo the study

Place:

Date:

Signature of the participant

## ஆராய்ச்சியில் பங்குபெருபவருக்கான ஒப்புதல் படிவம்

**அன்பார்ந்த பங்கு பெறுவோரே,**

நான் அப்போலோ செவிலியர் கல்லூரியில் முதுகலை செவிலியர் பயிற்று பெரும் மாணவி. என்னுடைய பயிற்சியின் ஒரு பகுதியாக சிறப்பு பயிற்சி மூலமாக மன அழுத்ததின் அளவைப் பற்றி அறிய ஆராய்ச்சி செய்கிறேன். இந்த ஆராய்ச்சியில் நீங்கள் பங்கு பெற, உங்களுடைய ஒப்புதல் மற்றும் ஒத்தழைப்பையும் வேண்டுகிறேன். உங்களுடைய குறிப்புகள் இரகசியமாக வைக்கப்படும், மற்றும் உங்களுடைய பெயர் வேறு எங்கும் வெளியிடப்படமாட்டாது.

ஆராய்ச்சியாளரின் கையொப்பம்

..... என்கிற நான், இந்த ஆராய்ச்சியில் பங்கு பெற ஒப்புதல் அளிக்கிறேன்

பங்கு பெறுவோரின் கையொப்பம்

## APPENDIX VIII

### CERTIFICATE FOR ENGLISH EDITING

### TO WHOMSOEVERIT MAY CONCERN

This is to certify that the dissertation "A Quasi experimental study to assess the effectiveness of cucumber juice upon blood pressure level in hypertensive clients at selected wards of Thiruverkadu, Chennai" by Ms.Kochurani Benny, IIyr MSc (N) student, Apollo College Of Nursing was edited for English language appropriateness by

N.G.MURALEEDHARA KURUP
Lecturer in English
College of Applied Sciences (IHRD)
Mavelikkara, Alappuzha - 690 101

COLLEGE OF APPLIED SCIENCES (IHRD) MAVELIKKARA ALAPPUZHA PIN: 690 101

## APPENDIX IX

### CERTIFICATE FOR TAMIL EDITING

### TO WHOMSOEVERIT MAY CONCERN

This is to certify that the tool for demographic variable proforma, clinical variable proforma, rating scale on satisfaction regarding administration of cucumber juice translated by Ms.Kochurani Benny, IIyr MSc (N) student, Apollo College Of Nursing, for her dissertation "A Quasi experimental study to assess the effectiveness of cucumber juice upon blood pressure level in hypertensive clients at selected wards of Thiruverkadu, Chennai" was edited for Tamil language appropriateness by

Signature

ச.ஸ்ரீபதிநாயுடு, M.A.B.Ed.
பட்டதாரி ஆசிரியர்,
அரசுஉயர்நிலைப்பள்ளி,
சிட்லபாக்கம், சென்னை - 64

## APPENDIX X

## DEMOGRAPHIC VARIABLE PROFORMA OF HYPERTENSIVE CLIENTS

**Purpose**

This proforma is used to measure the demographic variables of hypertensive clients such as age, gender, educational status, marital status, income, personal habits, occupation and religion.

**Instruction**

The researcher collects the following information from the research participants by asking question in the interview form and marks appropriate tick (√) mark in the space provided as per their response.

Sample number:-

1. **Age in years**

   1.1 31-40 ☐

   1.2 41-50 ☐

   1.3 51-60 ☐

   1.4 60-70 ☐

2. **Gender**

   2.1 Male ☐

   2.2 Female ☐

3. **Educational status**

   3.1 No formal education ☐

   3.2 Primary education ☐

   3.3 Secondary education ☐

   3.4 Higher secondary level ☐

   3.5 Degree and above ☐

**4. Marital status**

4.1 Married ☐

4.2 Unmarried ☐

4.3 Widow / widower ☐

4.4 Divorce/separated ☐

**5. Religion**

5.1 Hindu ☐

5.2 Christian ☐

5.3 Muslim ☐

5.4 If others specify…….....

**6. Family income per month**

6.1 ≤10,000 ☐

6.2 10,001 -15000 ☐

6.3 15,001 -20000 ☐

6.4 >20000 ☐

**7. Occupation**

7.1 Homemaker ☐

7.2 Labourer ☐

7.3 Business ☐

7.4 Government employee ☐

7.5 Private employee ☐

7.6 Retired ☐

## சமூக அறிவியல் பட்டியல்

**நோக்கம்**

வயது, பாலினம், மதம், கல்விநிலை, குடும்ப வகை, திருமணநிலை, மாதாந்திர வருமானம், வருமானத்திற்கான ஆதாரம் போன்ற மக்களியல் சார்ந்த மாற்றத்தக்கவைகளை அளவிடுவதற்கு இப்படிவம் பயன்படுத்தப்படுகிறது. இவை உயர் இரத்த அழுத்தம் உள்ள நபர்களின் சமூக மற்றும் குடும்ப தகவல்களை மதிப்பிடுவதற்காக வடிவமைக்கப்பட்டுள்ளது.

**அறிவுறுத்துதல்**

கீழ்வரும் தகவல்கள் ஆய்வாளரால் நேர்முக கலந்துரையாடல் மூலமும், நேர்கானல் மூலமும் சேகரிக்கப்படும். தயவுசெய்து உங்களது பதில்களை சுதந்திரமாகவும் மற்றும் வெளிப்படையாகவும் தெரிக்கவும். தகவல்கள் ரகசியமாக வைக்கப்படும் மற்றும் ஆராய்ச்சி நோக்கங்களுக்காக மட்டுமே அவை பயன்படுத்தப்படும்.

**1. வயது**

1.1 31-40 ☐

1.2 41-50 ☐

1.3 51-60 ☐

1.4 60-70 ☐

**2. பாலினம்**

2.1 ஆண் ☐

2.2 பெண் ☐

**3. கல்வி நிலை**

3.1 கல்வியறிவு அற்றவர் ☐

3.2 தொடக்க கல்வி ☐

3.3 நடுநிலைக் கல்வி ☐

3.4 உயர்நிலைக்கல்வி ☐

3.5 பட்டப்படிப்பு மற்றும் அதற்குமேல் ☐

**4. திருமண நிலை**

4.1 திருமணமானவர் ☐

4.2 திருமணமாகாதவர் ☐

4.3 விதவை / மனைவியை இழந்தவர் ☐

4.4 பிரிந்து வாழ்பவர் / விவாகரத்தானவர் ☐

**5. மதம்**

5.1 இந்து ☐

5.2 கிறிஸ்துவர் ☐

5.3 இஸ்லாமியர் ☐

5.4 பிற (குறிப்பிடவும்) ☐

**6. மாதாந்திர வருமானம்**

6.1 ≤ 10,000 ☐

6.2 10,001 - 15000 ☐

6.3 15,001 - 20000 ☐

6.4 > 20000 ☐

**7. தொழில்**

7.1 வீட்டு நிர்வாகி ☐

7.2 கூலித் தொழிலாளி ☐

7.3 வியாபாரம் ☐

7.4 அரசு பணியாளர் ☐

7.5 தனியார் நிறுவன தொழிலாளி ☐

7.6 ஓய்வு பெற்றவர் ☐

## APPENDIX XI

## CLINICAL VARIABLE PROFORMA OF HYPERTENSIVE CLIENTS

**Purpose**

This proforma is used to assess the risk factors for hypertension

**Instruction**

The researcher collects the following information from the research participants by asking question in the interview form and marks appropriate tick (√) mark in the space provided as per their response. Question 1, 2, and 3 will be filled by the researcher using bio physiological instruments.

1. **Height -----cms**

1.1 ≤ i50 ☐

1.2 151-160 ☐

1.3 161-170 ☐

1.4 171-180 ☐

1.5 >180 ☐

2. **Weight ------kgs**

2.1 ≤ 40 ☐

2.2 41-50 ☐

2.3 51-60 ☐

2.4 61-70 ☐

2.5 71-80 ☐

2.6 >80 ☐

**3. Body mass index (kg/m2)**

3.1 <18.4 ☐

3.2 18.5-22.9 ☐

3.3 23-29.9 ☐

3.4 >30 ☐

**4. Habit of taking non vegetarian diet**

4.1Yes ☐

4.2 No ☐

**5. If yes, how many times do you take non- vegetarian food?**

5.1 Daily ☐

5.2 Once in a week ☐

5.3 Twice in a week ☐

5.4 Thrice in a week ☐

5.5 Monthly once ☐

**6. Nature of physical activity**

6.1 Sedentary ☐

6.2 Moderate ☐

6.3 Heavy ☐

**7. History of hypertension**

7.1 <1yr ☐

7.2 1-3yrs ☐

7.3 3-5yrs ☐

7.4 >5yrs ☐

**8. Family history of hypertension**

8.1 No ☐

8.2 Siblings ☐

8.3 Parents ☐

8.4 Grand parents ☐

**9. History of taking anti hypertensive drugs**

9.1 No ☐

9.2 Regularly ☐

9.3 Occasionally ☐

9.4 Only during discomfort ☐

**10. History of co-morbidities**

10.1 No ☐

10.2 Diabetes ☐

10.3 Kidney disease ☐

10.4 Heart disease ☐

10.5 Others specify…… ☐

**11. History of other alternative treatment for hypertension**

11.1 No ☐

11. Yes (specify)…… ☐

**12. Habit of smoking**

12.1Smoker ☐

12.2 Non-smoker ☐

**13. Habit of alcoholism**

13.1 Alcoholic ☐

13.2 Non-alcoholic ☐

## மருத்துவம் சார்ந்த மாறுபட்ட குறிப்புகள்

**நோக்கம்**

இந்த குறிப்புகள் உயர் இரத்த அழுத்தத்தை உண்டாக்கும் ஆபத்தான காரணிகள் பற்றி மதிப்பிட பயன்படுத்தப்படுகிறது.

**அறிவுறுத்தல்**

கீழ்வரும் தகவல்கள் ஆய்வாளரால் நேர்முக கலந்துரையாடல் மூலமும், நேர்காணல் மூலமும் சேகரிக்கப்படும். தயவுசெய்து உங்களது பதில்களை சுதந்திரமாகவும் மற்றும் வெளிப்படையாகவும் தெரிவிக்கவும். தகவல்கள் ரகசியமாக வைக்கப்படும் மற்றும் ஆராய்ச்சி நோக்கங்களுக்காக மட்டுமே அவை பயன்படுத்தப்படும்.

**1. உயரம்**

1.1 ≤ 150 ☐

1.2 151-160 ☐

1.3 161-170 ☐

1.4 171-180 ☐

1.5 > 180 ☐

**2.எடை**

2.1 ≤ 40 ☐

2.2 41-50 ☐

2.3 51-60 ☐

2.4 61-70 ☐

2.5 71-80 ☐

2.6 > 80 ☐

**3. உடல் பருமன் குறியீட்டெண் (கிகி/ மீ$^2$)**

3.1 < 18.4 ☐

3.2 18.5-22.9 ☐

3.3 23-29.9 ☐

3.4 > 30 ☐

**4. மாமிச உணவு எடுத்துக்கொள்ளும் பழக்கம்**

4.1 ஆம் ☐

4.2 இல்லை ☐

**5. ஆம் எனில் எத்தனை முறை மாமிச உணவு எடுப்பீர்கன்**

5.1 தினமும் ☐

5.2 வாரத்தில் ஒருமுறை ☐

5.3 வாரத்தில் இருமுறை ☐

5.4 வாரத்தில் மூன்று முறை ☐

5.5 மாதத்திற்கு ஒருமுறை ☐

**6. உடல் உழைப்பு தன்மை**

6.1 சுறுசுறுப்பற்ற வேலை செய்பவர் ☐

6.2 மிதமான வேலை செய்பவர் ☐

6.3 வலிமையான வேலை செய்பவர் ☐

**7. உயர் இரத்த அழுத்தத்தின் கால அளவு**

7.1 < வருடம் ☐

7.2 1-3 வருடம் ☐

7.3 3-5 வருடம் ☐

7.4 > 5 வருடம் ☐

**8. குடும்பத்தில் உயர் இரத்த அழுத்தத்தின் வரலாறு**

8.1 கிடையாது ☐

8.2 இரட்டையர் / உடன் பிறந்தவர் ☐

8.3 பெற்றோர்கள் ☐

8.4 மூதாதையர் ☐

**9. உயர் இரத்த அழுத்தத்திற்கு மருந்து எடுத்து கொள்ளும் வரலாறு**

9.1 கிடையாது ☐

9.2 தவறாமல் ☐

9.3 எப்பொழுதாவது ☐

9.4 இடையூரின் போது ☐

**10. வேறு ஏதேனும் நோய் உள்ளதா**

10.1 கிடையாது ☐

10.2 நீரிழிவு (சர்க்கரை நோய்) ☐

10.3 சிறுநீரக நோய்கள் ☐

10.4 இருதய நோய்கள் ☐

10.5 பிற (குறிப்பிடவும்) ☐

**11. மருந்தியல் அல்லாத அளவீட்டில் மிக உபயோகமான முறை**

11.1 இல்லை ☐

11.2 ஆம் (குறிப்பிடவும்) ☐

**12. புகைபிடிக்கும் பழக்கம்**

12.1 புகைபிடிப்பவர் ☐

12.2 புகைபிடிக்காதவர் ☐

**13 மது அருந்தும் பழக்கம்**

13.1 மது அருந்துபவர் ☐

13.2 மது அருந்தாதவர் ☐

## APPENDIX XII

## BLOOD PRESSURE ASSESSMENT CHART
## OBSERVATIONAL CHECK LIST TO MONITOR BLOOD PRESSURE

**Purpose**

This check list is used to record the blood pressure values of hypertensive clients.

**Instruction**

The researcher will record the blood pressure values among hypertensive clients before, during and after cucumber juice therapy.

| **Observation** | **Day of observation** | **Blood pressure in mmof Hg** | |
|---|---|---|---|
| | | **Systolic blood pressure** | **Diastolic blood pressure** |
| 1 | 1st reading before the therapy (1st day) | | |
| 2 | 7th day of the therapy (after 1st week) | | |
| 3 | 14th day of the therapy (after 2nd week) | | |
| 4 | 21st day of the therapy (after 3rd week) | | |
| 5 | 30th day of the therapy (post test) | | |

**Interpretations of blood pressure**

The blood pressure values were classified based on the British Hypertension Society as follows

| Range | Systolic blood pressure | Diastolic blood pressure |
|---|---|---|
| Mild | 140-159 mm of Hg | 90-99 mm of Hg |
| Moderate | 160-179 mm of Hg | 100-109 mm of Hg |
| Severe | >180 mm of Hg | >_110 mm of Hg |

## APPENDIX XIII

## BLUE PRINT FOR LEVEL OF SATISFACTION

## REGARDING CUCUMBER JUICE ADMINISTRATION

| ITEM GROUPING | ITEM NUMBER | TOTAL NUMBER OF ITEMS | PERCENTAGE |
|---|---|---|---|
| Characteristics of the researcher | 1,2,3 | 3 | 30 |
| Nature of cucumber juice | 4,5,8 | 3 | 30 |
| Method of administration | 6,7 | 2 | 20 |
| Effectiveness of the therapy | 9,10 | 2 | 20 |
| | **TOTAL** | **10** | **100%** |

**RATING SCALE ON SATISFACTION REGARDING ADMINISTRATION OF CUCUMBER JUICE**

The rating scale is used by the investigator to assess the level of satisfaction among experimental group of hypertensive clients on cucumber juice therapy and its effectiveness. This is assessed by the researcher on the 31st day

**Instruction to the Participants**

There are 10 items given below .Each item has 4 options highly satisfied, satisfied, dissatisfied and highly dissatisfied. Describe your satisfaction regarding the administration of cucumber juice. Please be frank in answering the following questions. Your answer will be kept confidential.

| S.NO | ITEM | Highly satisfied | Satisfied | Dissatisfied | Highly dissatisfied |
|---|---|---|---|---|---|
| 1 | Are you satisfied with the explanation given by the researcher well in advance regarding cucumber juice therapy. | | | | |
| 2 | Are you comfortable with the approach of the researcher. | | | | |
| 3 | Are you satisfied with the method of evaluation by the researcher. | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 4 | Are you satisfied with the amount of cucumber juice | | | | |
| 5 | Are you satisfied with the taste of cucumber juice | | | | |
| 6 | Are you satisfied with the preparation of cucumber juice | | | | |
| 7 | Are you satisfied with the cost effectiveness of the therapy | | | | |
| 8 | Are you satisfied with the availability of cucumber juice | | | | |
| 9 | Are you satisfied with the effectiveness of the therapy | | | | |
| 10 | Are you satisfied with the duration of cucumber juice | | | | |

**SCORING**

Highly dissatisfied - 1

Dissatisfied - 2

Satisfied - 3

Highly satisfied - 4

The total score is converted in to percentage and graded as given below

| | |
|---|---|
| >76% | Highly satisfied |
| 51-75% | Satisfied |
| 26-50% | Dissatisfied |
| < 25% | Highly dissatisfied |

## வெள்ளரிசாறின் திருப்தியை அளக்கும் தர அளவுகோல்

**நோக்கம்**

இந்த தர அளவுகோல் இரத்த அழுத்தம் அதிகமாக உள்ளவர்களுக்கு வெள்ளரி சாறினை அளிப்பதன் மூலம் ஏற்படும் திருப்தியின் அளவை அறியப் பயன்படுகிறது.

**குறிப்பு**

இங்கு பத்து தனி விவரங்கள் கீழே கொடுக்கப்பட்டுள்ளது. ஒவ்வொரு தனி விவரத்திற்கும் நான்கு பதில்கள் உள்ளன. ஒவ்வொரு கேள்வியின் பதிலையும் மிகவும் திருப்தியாக உள்ளதா அல்லது அதிருப்தியாக உள்ளதா எனக் குறிப்பிடவும்.

| வ.எண் | விவரம் | மிகவும் திருப்தி 4 | திருப்தி 3 | அதிருப்தி 2 | மிகவும் திருப்தியற்றவர் 1 |
|---|---|---|---|---|---|
| 1. | ஆய்வாளர் அளித்த வெள்ளரி சாறின் விவரம் திருப்தியாக உள்ளதா | | | | |
| 2. | ஆய்வாளரின் அணுகுமுறை திருப்தியாக உள்ளதா | | | | |
| 3. | ஆய்வாளர் மதிப்பிட்ட வகைகள் திருப்தியாக உள்ளதா | | | | |
| 4. | வெள்ளரி சாறின் அளவு உங்களுக்கு திருப்தியாக உள்ளதா | | | | |
| 5. | வெள்ளரி சாறின் சுவை திருப்தியாக உள்ளதா | | | | |
| 6. | வெள்ளரி சாறின் தயாரிப்பு திருப்தியாக உள்ளதா | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 7. | வெள்ளரி சாறு சிகிச்சை சிக்கனமானதாக உள்ளதா | | | | |
| 8. | வெள்ளரி சாறு கிடைக்கக்கூடியதாக உள்ளதா | | | | |
| 9. | வெள்ளரி சாறின் சிகிச்சை முறை பயனளிப்பதாக உள்ளதா | | | | |
| 10. | வெள்ளிரி சாறின் அளவுகாலம் திருப்தியாக உள்ளதா | | | | |

**மதிப்பெண் விளக்கம்**

மிகவும் திருப்தியற்றவர் - 1

அதிருப்தி - 2

திருப்தி - 3

மிகவும் திருப்தி - 4

**சதவீதம்**

| | |
|---|---|
| >76% | மிகவும் திருப்தி |
| 51-75% | திருப்தி |
| 26-50% | அதிருப்தி |
| < 25% | மிகவும் திருப்தியற்றவர் |

## APPENDIX XIV
## DATA CODE SHEET

**AG- Age**
1.31 – 40
2.41 – 50
3.51 – 60
4.61 – 70

**GE- Gender**
1.Male
2.Female

**ES- Educational status**
1. No formal education
2.Primary school
3.High school
4.Higher secondary
5.Graduate.

**OS- Occupational status**
1.Unemployed
2.Government
3.Private
4.Housewife
5.Business

**RE- Religion**
1.Hindu
2.Christian
3.Muslim

**MS – Marital status**
1.Married
2.Unmarried
3.Divorced
4. Widow

**FI-Family income**
1 ≤10,000
2 10,001 -15000
3 15,001 -20000
4 >20000

**HOS- Habit of smoking**
1. Smoker
2. Non – smoker

**HOA- Habit of alcoholism**
1. Alcoholic
2. Non – alcoholic

**HH-History of hypertension**
1 <1yr
2 1-3yrs
3 3-5yrs
4 >5yrs

**WT- Weight**
1 41-50
2. 51-60
3. 61-70
4. >70kg

**HT- Height**
1. ≤ i50
2.151-160
3.161-170
4.171-180
5.>180

**BMI- Body mass index**
1. Less than 18.4
2. 18.5-22.5
3. 22.6-29.9
4. More than 30

**FH- Family history of Hypertension**
1. No
2. Siblings
3. Parents
4. Grand parents

**PC-Presence of other co morbidities**
1. No
2 .Diabetes
3. Kidney disease
4. Heart disease

**DP- Diet pattern**
1. Vegetarian
2. Non – vegetarian

## APPENDIX XV

## MASTER CODING SHEET

## EXPERIMENTAL GROUP

| SL.NO | DEMOGRAPHIC VARIABLE | | | | | | | CLINICAL VARIABLE | | | | | | | | | | | | | LEVEL OF SATISFACTION | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AG | GE | ES | MS | RE | FI | OS | HT | WT | BMI | DP | FY | PA | HH | FH | DS | PC | AT | HS | HA | SC | PER | LEVEL |
| 1 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 8 | 95 | HS |
| 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 3 | 1 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 7 | 92 | HS |
| 3 | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 3 | 1 | 1 | 3 | 2 | 2 | 1 | 2 | 2 | 7 | 92 | HS |
| 4 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 3 | 1 | 1 | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 7 | 92 | HS |
| 5 | 2 | 2 | 2 | 1 | 1 | 3 | 2 | 4 | 2 | 2 | 1 | 4 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 4 | 85 | HS |
| 6 | 1 | 2 | 2 | 1 | 2 | 3 | 1 | 3 | 3 | 1 | 1 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 7 | 92 | HS |
| 7 | 2 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | 4 | 1 | 1 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 9 | 97 | HS |
| 8 | 3 | 2 | 3 | 1 | 1 | 2 | 2 | 1 | 4 | 1 | 1 | 2 | 2 | 1 | 4 | 2 | 2 | 1 | 2 | 1 | 6 | 90 | HS |
| 9 | 2 | 2 | 4 | 1 | 1 | 2 | 3 | 1 | 3 | 1 | 1 | 2 | 1 | 2 | 3 | 2 | 3 | 1 | 1 | 2 | 5 | 87 | HS |
| 10 | 3 | 2 | 2 | 1 | 1 | 2 | 6 | 2 | 2 | 1 | 1 | 3 | 1 | 2 | 1 | 4 | 1 | 1 | 2 | 2 | 7 | 92 | HS |
| 11 | 3 | 1 | 2 | 1 | 1 | 2 | 5 | 1 | 3 | 1 | 1 | 5 | 2 | 1 | 3 | 2 | 1 | 1 | 2 | 1 | 8 | 95 | HS |
| 12 | 4 | 1 | 2 | 1 | 2 | 1 | 5 | 2 | 4 | 1 | 1 | 2 | 1 | 2 | 4 | 2 | 2 | 1 | 2 | 1 | 9 | 97 | HS |
| 13 | 4 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 8 | 95 | HS |
| 14 | 4 | 2 | 2 | 1 | 1 | 2 | 3 | 1 | 3 | 1 | 1 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 9 | 97 | HS |
| 15 | 4 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 4 | 2 | 2 | 1 | 2 | 2 | 8 | 95 | HS |
| 16 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 5 | 1 | 1 | 4 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 7 | 92 | HS |
| 17 | 4 | 2 | 2 | 1 | 1 | 2 | 1 | 3 | 4 | 3 | 1 | 4 | 2 | 2 | 1 | 3 | 1 | 1 | 2 | 2 | 7 | 92 | HS |
| 18 | 3 | 2 | 3 | 1 | 1 | 1 | 1 | 2 | 5 | 1 | 1 | 3 | 1 | 2 | 3 | 2 | 1 | 1 | 2 | 2 | 6 | 90 | HS |
| 19 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 1 | 3 | 2 | 1 | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 1 | 2 | 7 | 92 | HS |
| 20 | 4 | 1 | 3 | 1 | 1 | 3 | 5 | 3 | 5 | 1 | 1 | 3 | 1 | 2 | 3 | 2 | 1 | 1 | 2 | 2 | 6 | 90 | HS |
| 21 | 4 | 2 | 2 | 1 | 1 | 4 | 5 | 4 | 2 | 1 | 1 | 3 | 2 | 2 | 1 | 2 | 3 | 1 | 2 | 2 | 8 | 92 | HS |
| 22 | 4 | 1 | 3 | 1 | 1 | 4 | 2 | 4 | 3 | 1 | 1 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 9 | 97 | HS |
| 23 | 4 | 2 | 4 | 1 | 1 | 4 | 2 | 5 | 5 | 1 | 1 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 8 | 95 | HS |
| 24 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 7 | 92 | HS |
| 25 | 4 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 3 | 1 | 1 | 3 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 8 | 95 | HS |
| 26 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 3 | 4 | 2 | 1 | 2 | 2 | 9 | 97 | HS |
| 27 | 4 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 4 | 1 | 1 | 3 | 1 | 2 | 4 | 2 | 2 | 1 | 2 | 2 | 6 | 90 | HS |
| 28 | 4 | 2 | 1 | 1 | 1 | 3 | 3 | 2 | 3 | 1 | 1 | 2 | 2 | 2 | 4 | 2 | 1 | 1 | 2 | 1 | 9 | 97 | HS |
| 29 | 4 | 2 | 1 | 1 | 2 | 3 | 5 | 3 | 3 | 2 | 1 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 9 | 97 | HS |
| 30 | 4 | 2 | 2 | 1 | 1 | 3 | 6 | 2 | 4 | 1 | 1 | 3 | 1 | 2 | 3 | 2 | 1 | 1 | 2 | 2 | 9 | 97 | HS |

# MASTER CODING SHEET

## CONTROL GROUP

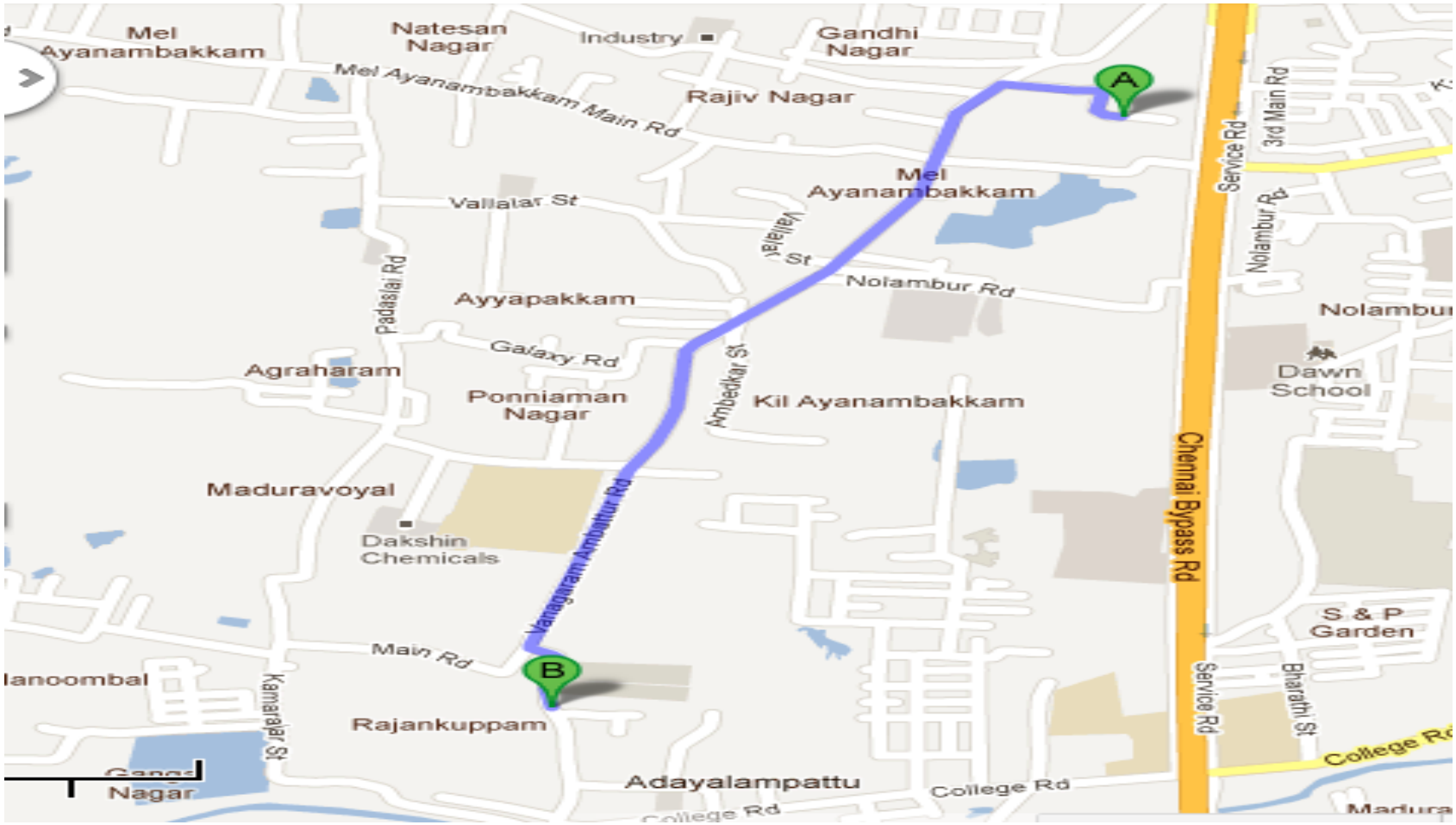
| | DEMOGRAPHIC VARIABLE | | | | | | | CLINICAL VARIABLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SL.NO | AG | GE | ES | MS | RE | FI | OS | HT | WT | BMI | DP | FY | PA | HH | FH | DS | PC | AT | HS | HA |
| 1 | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| 2 | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 |
| 3 | 4 | 2 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 3 | 2 | 1 | 1 | 2 | 2 |
| 4 | 3 | 2 | 2 | 1 | 1 | 3 | 1 | 1 | 3 | 2 | 1 | 3 | 1 | 1 | 3 | 2 | 2 | 1 | 2 | 2 |
| 5 | 4 | 1 | 3 | 1 | 1 | 1 | 2 | 1 | 4 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| 6 | 3 | 2 | 1 | 1 | 1 | 2 | 3 | 1 | 3 | 3 | 1 | 3 | 1 | 2 | 4 | 2 | 1 | 1 | 2 | 2 |
| 7 | 1 | 1 | 2 | 1 | 1 | 2 | 3 | 2 | 4 | 2 | 1 | 2 | 1 | 1 | 3 | 2 | 2 | 1 | 2 | 2 |
| 8 | 2 | 2 | 3 | 1 | 1 | 2 | 5 | 2 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 |
| 9 | 2 | 2 | 1 | 1 | 1 | 3 | 4 | 2 | 4 | 3 | 1 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 |
| 10 | 3 | 1 | 1 | 1 | 2 | 4 | 6 | 3 | 4 | 2 | 1 | 4 | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 2 |
| 11 | 3 | 1 | 1 | 1 | 1 | 4 | 6 | 2 | 5 | 3 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| 12 | 2 | 1 | 2 | 1 | 1 | 3 | 4 | 1 | 3 | 2 | 1 | 5 | 1 | 1 | 3 | 3 | 2 | 1 | 1 | 2 |
| 13 | 3 | 2 | 3 | 1 | 2 | 3 | 2 | 2 | 2 | 3 | 1 | 2 | 2 | 2 | 4 | 2 | 1 | 1 | 2 | 2 |
| 14 | 4 | 2 | 4 | 1 | 1 | 2 | 1 | 1 | 3 | 2 | 1 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 2 |
| 15 | 4 | 2 | 2 | 1 | 2 | 2 | 3 | 1 | 4 | 2 | 1 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 |
| 16 | 3 | 2 | 2 | 1 | 2 | 3 | 4 | 2 | 4 | 2 | 1 | 4 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| 17 | 4 | 2 | 2 | 1 | 1 | 1 | 5 | 3 | 5 | 2 | 1 | 5 | 2 | 1 | 3 | 3 | 2 | 1 | 2 | 2 |
| 18 | 2 | 1 | 3 | 1 | 2 | 4 | 6 | 1 | 2 | 3 | 1 | 5 | 1 | 1 | 1 | 4 | 1 | 1 | 2 | 1 |
| 19 | 1 | 2 | 3 | 1 | 1 | 2 | 6 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| 20 | 3 | 2 | 4 | 1 | 1 | 3 | 3 | 2 | 4 | 2 | 1 | 3 | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 2 |
| 21 | 4 | 2 | 2 | 1 | 1 | 4 | 2 | 3 | 4 | 2 | 1 | 3 | 1 | 2 | 4 | 2 | 2 | 1 | 2 | 1 |
| 22 | 4 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 2 | 1 | 2 | 2 | 2 | 1 | 4 | 1 | 1 | 2 | 2 |
| 23 | 3 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 2 | 3 | 4 | 1 | 1 | 2 | 2 |
| 24 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| 25 | 4 | 2 | 2 | 1 | 1 | 1 | 1 | 4 | 4 | 2 | 1 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 |
| 26 | 3 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | 5 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 |
| 27 | 4 | 2 | 1 | 1 | 2 | 1 | 1 | 4 | 3 | 3 | 1 | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 |
| 28 | 4 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 2 |
| 29 | 3 | 2 | 2 | 1 | 2 | 2 | 1 | 4 | 4 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 |
| 30 | 4 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 |

# MASTER CODING SHEET

| | LEVEL OF BLOOD PRESSURE OF CONTROL | | | | | | | | | | LEVEL OF BLOOD PRESSURE OF EXPERIMENTAL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PRE-TEST | | END OF 1ST WEEK | | END OF 2nd WEEK | | END OF 3rd WEEK | | POST TEST | | PRE-TEST | | END OF 1ST WEEK | | END OF 2nd WEEK | | END OF 3rd WEEK | | POST TEST | |
| SNO | SBP | DBP | SBP | DBP | SBP | DBP | SBP | DBP | SBP | DBP | SBP | DBP | SBP | DBP | SBP | DBP | SBP | DBP | SBP | DBP |
| 1 | 160 | 100 | 150 | 90 | 150 | 80 | 140 | 80 | 150 | 90 | 150 | 90 | 150 | 90 | 148 | 80 | 140 | 70 | 130 | 70 |
| 2 | 170 | 100 | 150 | 90 | 150 | 80 | 150 | 80 | 160 | 90 | 150 | 90 | 150 | 80 | 140 | 80 | 130 | 70 | 130 | 70 |
| 3 | 140 | 90 | 160 | 80 | 130 | 80 | 130 | 80 | 140 | 80 | 160 | 90 | 156 | 90 | 150 | 90 | 140 | 80 | 130 | 80 |
| 4 | 140 | 100 | 130 | 90 | 140 | 80 | 140 | 80 | 130 | 90 | 140 | 90 | 140 | 80 | 140 | 70 | 140 | 80 | 120 | 80 |
| 5 | 140 | 90 | 140 | 80 | 130 | 70 | 130 | 70 | 140 | 80 | 170 | 100 | 160 | 90 | 140 | 80 | 140 | 70 | 126 | 80 |
| 6 | 180 | 110 | 140 | 90 | 140 | 90 | 140 | 80 | 160 | 100 | 160 | 100 | 150 | 90 | 140 | 80 | 140 | 80 | 130 | 80 |
| 7 | 160 | 90 | 160 | 90 | 140 | 80 | 130 | 90 | 160 | 90 | 150 | 90 | 150 | 90 | 140 | 80 | 130 | 80 | 130 | 80 |
| 8 | 170 | 110 | 140 | 90 | 130 | 80 | 130 | 80 | 160 | 100 | 150 | 100 | 150 | 90 | 140 | 70 | 130 | 80 | 130 | 70 |
| 9 | 140 | 90 | 150 | 80 | 130 | 80 | 140 | 80 | 140 | 90 | 140 | 100 | 130 | 90 | 130 | 80 | 126 | 70 | 120 | 80 |
| 10 | 140 | 110 | 130 | 100 | 140 | 90 | 140 | 90 | 140 | 100 | 140 | 90 | 130 | 90 | 130 | 80 | 130 | 70 | 124 | 80 |
| 11 | 150 | 90 | 140 | 90 | 130 | 80 | 130 | 80 | 150 | 80 | 150 | 90 | 140 | 80 | 130 | 70 | 120 | 80 | 126 | 80 |
| 12 | 150 | 100 | 150 | 90 | 150 | 90 | 140 | 80 | 140 | 90 | 140 | 100 | 130 | 80 | 130 | 80 | 130 | 70 | 130 | 80 |
| 13 | 150 | 100 | 150 | 90 | 140 | 80 | 140 | 80 | 160 | 80 | 140 | 90 | 130 | 80 | 130 | 80 | 120 | 80 | 130 | 70 |
| 14 | 170 | 110 | 140 | 90 | 160 | 80 | 150 | 90 | 160 | 90 | 140 | 90 | 140 | 90 | 140 | 80 | 130 | 80 | 120 | 70 |
| 15 | 150 | 90 | 160 | 90 | 130 | 90 | 130 | 90 | 150 | 90 | 170 | 90 | 150 | 80 | 140 | 80 | 130 | 80 | 110 | 80 |
| 16 | 160 | 100 | 140 | 100 | 130 | 90 | 130 | 90 | 140 | 80 | 180 | 100 | 160 | 90 | 150 | 80 | 140 | 80 | 140 | 80 |
| 17 | 160 | 90 | 150 | 80 | 140 | 80 | 140 | 80 | 150 | 90 | 180 | 100 | 160 | 80 | 150 | 80 | 140 | 70 | 130 | 80 |
| 18 | 170 | 90 | 140 | 80 | 150 | 80 | 150 | 80 | 170 | 80 | 170 | 90 | 150 | 80 | 150 | 80 | 150 | 80 | 130 | 80 |
| 19 | 180 | 100 | 160 | 90 | 160 | 80 | 140 | 80 | 170 | 100 | 180 | 100 | 160 | 90 | 160 | 80 | 150 | 70 | 140 | 70 |
| 20 | 160 | 100 | 160 | 90 | 150 | 80 | 150 | 80 | 150 | 100 | 170 | 110 | 150 | 100 | 150 | 90 | 150 | 80 | 110 | 80 |
| 21 | 150 | 90 | 150 | 80 | 140 | 70 | 130 | 80 | 140 | 90 | 140 | 110 | 130 | 90 | 130 | 80 | 130 | 70 | 120 | 70 |
| 22 | 140 | 90 | 130 | 70 | 120 | 80 | 130 | 80 | 130 | 80 | 150 | 100 | 130 | 90 | 130 | 80 | 130 | 80 | 110 | 80 |
| 23 | 140 | 100 | 130 | 80 | 120 | 80 | 120 | 80 | 140 | 90 | 150 | 90 | 144 | 80 | 140 | 70 | 140 | 80 | 130 | 80 |
| 24 | 170 | 90 | 160 | 80 | 140 | 80 | 130 | 70 | 160 | 80 | 140 | 100 | 130 | 90 | 130 | 80 | 130 | 80 | 128 | 80 |
| 25 | 180 | 90 | 170 | 80 | 150 | 80 | 140 | 80 | 170 | 100 | 150 | 110 | 140 | 90 | 140 | 90 | 130 | 80 | 130 | 70 |
| 26 | 160 | 100 | 160 | 90 | 150 | 80 | 140 | 80 | 150 | 90 | 140 | 100 | 140 | 90 | 140 | 80 | 130 | 80 | 120 | 80 |
| 27 | 170 | 90 | 160 | 90 | 140 | 80 | 140 | 80 | 170 | 90 | 150 | 100 | 140 | 90 | 130 | 70 | 130 | 70 | 130 | 70 |
| 28 | 160 | 90 | 140 | 90 | 130 | 80 | 130 | 80 | 170 | 90 | 140 | 110 | 140 | 100 | 1140 | 90 | 130 | 80 | 128 | 80 |
| 29 | 160 | 100 | 150 | 100 | 130 | 90 | 130 | 90 | 160 | 90 | 150 | 100 | 140 | 90 | 130 | 80 | 130 | 80 | 122 | 80 |
| 30 | 140 | 90 | 140 | 80 | 130 | 80 | 130 | 80 | 140 | 90 | 140 | 90 | 130 | 80 | 140 | 80 | 130 | 80 | 130 | 80 |

**APPENDIX XVI**

**AREA MAP**



## APPENDIX XVIII

## IMAGES TAKEN DURING DATA COLLECTION